

The Relationship Between Depression, Parenting and Child Functioning: What About Fathers?

A thesis submitted in partial fulfilment of the requirements for the Degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

GERMAINE GERKEN

Department of Psychology

University of Canterbury

2017

Content

List of Tables	9
List of Figures.....	11
Acknowledgements	1
Abstract.....	3
Preface	5
Articles Arisen From This Thesis to Date	6
Copy of Co-Authorship.....	6
Alphabetical List of Key Abbreviations Used in This Thesis	7
Introduction	9
Background.....	9
Central Aims of This Thesis	10
Overview of This Thesis	11
Chapter 1: The Characteristics of Depression and General Gender Differences	15
Defining Depression.....	15
<i>Major Depressive Disorder (MDD)</i>	16
<i>Persistent Depressive Disorder (Dysthymia)</i>	18
<i>Depressive Symptoms</i>	19
Assessment of Depression.....	21
<i>Clinical Interviews</i>	21
<i>Self-Report Questionnaires</i>	22
Summary of Known Risk Factors of Depression	23
<i>Temperament</i>	24
<i>Genetics</i>	24
<i>Environmental Factors</i>	25
Gender Differences in Depression	26

<i>Expression of Depression</i>	<i>26</i>
<i>Gender Sensitivity of Depression Assessment Tools.....</i>	<i>30</i>
Conclusion.....	31
Chapter 2: The Characteristics of Depression in Parents.....	33
Depression in Mothers.....	33
<i>Prevalence and Characteristics of Maternal Depression.....</i>	<i>33</i>
<i>Risk Factors for Maternal Depression.....</i>	<i>35</i>
Depression in Fathers	36
<i>Prevalence and Characteristics of Paternal Depression.....</i>	<i>36</i>
<i>Risk Factors of Paternal Depression.....</i>	<i>39</i>
Conclusion.....	41
Chapter 3: Reviewing the Relationship Between Parental Depression, Parenting and Children’s Functioning	43
Child Functioning Across Developmental Domains: Definition and Terminology	43
<i>Theories of Child Development</i>	<i>47</i>
Summary of Reviews and Meta-Analyses Examining the Link Between Parental Depression and Child Functioning	52
<i>Functioning in Children of Depressed Mothers.....</i>	<i>52</i>
<i>Functioning in Children of Depressed Fathers.....</i>	<i>54</i>
The Relationship Between Depression, Parenting and Child Functioning: A Framework.....	57
<i>Belsky’s Model of Parenting</i>	<i>58</i>
Conclusion.....	65
Chapter 4: A Systematic Review on the Relationship Between Paternal Depression and Child Emotional and Behavioural Functioning (Study 1)	68
Introduction.....	68
<i>Purpose Of This Review</i>	<i>69</i>
Method	69
<i>Identifying Research Evidence</i>	<i>70</i>
<i>Study Selection.....</i>	<i>71</i>

<i>Assessment of Quality</i>	75
Results.....	77
<i>Study Characteristics</i>	77
<i>Quality of Included Studies</i>	87
<i>The Relationship Between Paternal Depression and Child Functioning</i>	99
Discussion.....	109
<i>Strengths and Limitations</i>	110
<i>Conclusion</i>	115
Chapter 5: The Relationship Between Paternal Depression, Parenting Behaviour and Child Functioning: An Exploratory Study (Study 2)	116
Introduction.....	116
<i>Purpose Of This Study</i>	117
Method	118
<i>Recruitment</i>	119
<i>Participants</i>	120
<i>Procedure</i>	121
<i>Measures</i>	122
<i>Data Analyses</i>	129
Results.....	129
<i>Demographic Characteristics of the Sample</i>	129
<i>Participant Characteristics</i>	134
<i>Research Question 1: Impact of Mental Health on Fathering</i>	136
<i>Research Question 2: Perceived Relationship Between Depression and Child Functioning</i>	136
<i>Research Question 3: Impact of Paternal Anxiety, Parenting Behaviour, Unemployment, Marital Satisfaction and Family Functioning on Depression and Child Functioning</i>	137
<i>Differences Between Depressed and Non-Depressed Fathers</i>	138
Discussion.....	139
<i>Strengths and Limitations</i>	143

<i>Implications for Future Research</i>	<i>147</i>
<i>Conclusion</i>	<i>148</i>
Chapter 6: Paternal Depression and Parenting Stress: A Review of the Literature (Study 3)	150
Introduction.....	150
<i>Purpose of This Review.....</i>	<i>151</i>
Method	151
Results.....	153
<i>Study Characteristics</i>	<i>153</i>
<i>Research Question 1: Gender Differences in Parenting Stress Levels.....</i>	<i>164</i>
<i>Research Question 2: Existence of a Relationship Between Depression and Parenting Stress....</i>	<i>164</i>
<i>Research Question 3: Direction of the Relationship Between Depression and Stress.....</i>	<i>165</i>
<i>Research Question 4: Existence of a Relationship Between Paternal Anxiety and Parenting Stress</i>	
.....	<i>166</i>
Discussion.....	166
<i>Strengths and Limitations.....</i>	<i>168</i>
<i>Implications for Future Research</i>	<i>169</i>
<i>Conclusion</i>	<i>169</i>
Chapter 7: The Relationship Between Depression and Anxiety, Parenting Stress and Child Functioning in Fathers and Mothers (Study 4).....	171
Introduction.....	172
<i>Purpose of This Study.....</i>	<i>175</i>
Method	176
<i>Participants.....</i>	<i>176</i>
<i>Procedure</i>	<i>177</i>
<i>Data Analysis.....</i>	<i>180</i>
Results.....	180
<i>Demographic Characteristics of the Sample.....</i>	<i>180</i>
<i>Participant Characteristics</i>	<i>184</i>

<i>Research Question 1: Fathers Depression Levels Postpartum vs. Two Years Later.....</i>	<i>186</i>
<i>Research Question 2: Relationship Between Depression/Anxiety and Child Functioning in Fathers and Mothers.....</i>	<i>186</i>
<i>Research Question 3: Association Between Parenting Stress and Depression/Anxiety and/or Child Functioning in Fathers and Mothers.....</i>	<i>189</i>
Discussion.....	191
<i>Strengths and Limitations.....</i>	<i>193</i>
<i>Implications for Future Research</i>	<i>194</i>
<i>Conclusion</i>	<i>194</i>
Chapter 8: Examining the Predictors of Parenting Stress in Fathers and Mothers (Study 5)	196
Introduction.....	196
<i>Parental Factors.....</i>	<i>197</i>
<i>Social Factors</i>	<i>199</i>
<i>Child Factors</i>	<i>201</i>
<i>Limitations of Previous Studies</i>	<i>202</i>
<i>Purpose of This Study.....</i>	<i>202</i>
Method	203
<i>Participants.....</i>	<i>203</i>
<i>Procedure</i>	<i>204</i>
<i>Data Analyses</i>	<i>206</i>
Results.....	208
<i>Participant Characteristics</i>	<i>208</i>
<i>Research Question 1: Testing the Model Fit for Parenting Stress Across Parents.....</i>	<i>211</i>
<i>Research Question 2: Determinants of Parenting Stress in Fathers.....</i>	<i>212</i>
<i>Research Question 3: Gender Role Differences in the Determinants of Parenting Stress</i>	<i>213</i>
Discussion.....	214
<i>Strengths and Limitations.....</i>	<i>218</i>

<i>Implications for Future Research</i>	219
<i>Conclusion</i>	219
Chapter 9: Examining the Impact of Child Functioning on Parenting Stress (Study 6).....	221
Introduction.....	221
<i>Limitations of Previous Studies</i>	223
<i>Purpose of This Study.....</i>	223
Method	224
<i>Participants.....</i>	224
<i>Procedure</i>	224
<i>Data Analysis</i>	224
Results.....	225
<i>Summary of Parental Measures</i>	225
<i>Child Functioning.....</i>	226
<i>Research Question 1: Child Cognitive and Physical Functioning as a Predictor of Parenting Stress</i>	226
<i>Research Question 2: Determinants of Parenting Stress After the Inclusion of the Child's</i> <i>Developmental Status</i>	227
<i>Research Question 3: Model Fit After Including Child Functioning.....</i>	229
Discussion.....	230
<i>Strengths and Limitations.....</i>	233
<i>Implications for Future Studies</i>	233
<i>Conclusion</i>	234
Chapter 10: Final Conclusion	235
Summary of Key Findings of this Thesis	235
Gender Role Differences in Depression, Parenting and its Relationship to Child Functioning....	237
The Adapted Belsky Model Fit: Paternal Depression, Parenting and Child Functioning.....	239
<i>Parental Factors.....</i>	239
<i>Social Factors</i>	244

<i>Child Factor</i>	246
Strengths and Limitations	250
Directions for Future Research	251
Clinical Implications	253
Final Conclusion	254
References	256
Appendices	305
Appendix A – Survey Part 1: Study 2	305
Appendix B – Survey Part 2: Study 2	343
Appendix C – Recruitment Documents: Study 2	347
Appendix D – Information Sheet for Participants: Study 2	348
Appendix E – Consent Form: Study 2	355
Appendix F – Additional Items For the Assessment of Paternal Depression: Study 2	356
Appendix G – Article Prepared for Submission to the Journal of Child and Family Studies	357

List of Tables

<i>Table 1 Study 1: Characteristics of the Studies Reviewed.....</i>	<i>79</i>
<i>Table 2 Study 1: Additional Variables Assessed by the Studies Under Review.....</i>	<i>85</i>
<i>Table 3 Study 1: Quality Assessment of the Studies based on the Adapted SIGN Checklist for Cohort Studies.....</i>	<i>94</i>
<i>Table 4 Study 1: Summary of the Reported Results on the Relationship Between Paternal Depression and Child Functioning.....</i>	<i>103</i>
<i>Table 5 Study 2: Demographic data - Fathers</i>	<i>130</i>
<i>Table 6 Study 2: Demographic data – Children.....</i>	<i>133</i>
<i>Table 7 Study 2: Participant Characteristics</i>	<i>136</i>
<i>Table 8 Study 2: Spearman Correlations Between Depression, Child Functioning and Co-Variables</i>	<i>138</i>
<i>Table 9 Study 2: Additional Depression Items – Fathers Responses in %.....</i>	<i>139</i>
<i>Table 10 Study 3: Characteristics and Results of the Studies</i>	<i>159</i>
<i>Table 11 Study 4: Demographics of Fathers vs. Mothers in Both Groups.....</i>	<i>182</i>
<i>Table 12 Study 4: Participant Characteristics Across Gender</i>	<i>185</i>
<i>Table 13 Study 4: Correlations Between Study Variables for Fathers and Mothers</i>	<i>188</i>
<i>Table 14 Spearman Correlations Between Parental Mental Health and Child Functioning Including Children With a Score of 1SD or 2SD Under the Norm.....</i>	<i>189</i>
<i>Table 15 Study 5: Participant Characteristics Across Gender</i>	<i>209</i>
<i>Table 16 Study 5: Spearman Correlations Between Study Variables for Fathers and Mothers</i>	<i>210</i>
<i>Table 17 Study 5: Bonding Subscales as a Predictor (B) of SD and HA in Fathers and Mothers</i>	<i>211</i>
<i>Table 18 Study 5: Parenting Stress Model Fit Indices Across Parents.....</i>	<i>212</i>

<i>Table 19 Study 5: Predictors (B) of Parenting Stress in Fathers and Mothers.....</i>	<i>214</i>
<i>Table 20 Study 6: Spearman Correlations Between Stress and Child Functioning in Fathers and Mothers</i>	<i>227</i>
<i>Table 21 Study 6: Predictors of Parenting Stress in Fathers and Mothers.....</i>	<i>228</i>
<i>Table 22 Study 6: Parenting Stress Model Fit Indices Across Parents.....</i>	<i>230</i>

List of Figures

<i>Figure 1. Conceptual overview of the thesis.....</i>	<i>14</i>
<i>Figure 2. Belsky's model of parenting (1984)</i>	<i>59</i>
<i>Figure 3. Adapted Belsky model – Framework for this thesis.</i>	<i>65</i>
<i>Figure 4. Study 1: Flow chart study screening.....</i>	<i>74</i>
<i>Figure 5. Study 3: Flow chart study screening.....</i>	<i>153</i>
<i>Figure 6. Study 5: AB Model for examining the predictors of parenting stress</i>	<i>203</i>
<i>Figure 7. Study 5: New parenting stress model presenting paternal results.</i>	<i>213</i>
<i>Figure 8. Study 6: Predictors of paternal parenting stress incl. child cognitive and physical functioning</i>	<i>229</i>
<i>Figure 9. Updated AB model presenting the results of this thesis.</i>	<i>249</i>

Acknowledgements

Firstly, I wish to express my gratitude to my primary supervisor Dr. Janet Carter for guiding me through this process. Thank you Janet for supporting me and sharing your expertise with me, providing feedback, and dealing with my constant impatience. You allowed me to find new paths and made sure that I was doing well: not just academically - thank you.

I wish to thank my secondary supervisors Dr. Jacki Henderson and Dr. Martin Dorahy for their on-going support and feedback over the years. Jacki, sharing your expertise in the area of developmental psychology with me has not only improved my thesis but will be very useful for my future career as a child psychologist. Martin, apart from the academic support, I have appreciated your emotional support immensely and will not forget your analogy of sewing a dress in regards to my thesis.

I want to thank Joseph (Joe) Boden for introducing me to the more sophisticated statistical analyses which, with your support, I was then able to perform by myself. I never thought statistics could be fun!

A huge thank you to all the participants who took the time to take part in the studies.

I would like to thank my friend Theresa for believing in me, motivating me in difficult times, and always being there for me despite the strain of the time difference.

I would also like to thank my New Zealand friends and flatmates for their support, in particular Sally and Paul for taking care of me and offering something like a family away from home.

Another big thank you goes to my family and my other friends around the world who have supported me through these years.

Many thanks, Germaine

Abstract

For the last few decades, fathers have become much more involved in childcare (Lamb, 2010), which has had many benefits, but also means children are more exposed to the emotional conditions of their fathers, such as depression. Despite the increased involvement, paternal depression and its relationship to child functioning is still understudied and many questions remain. In addition, increased paternal involvement could mean that fathers may have become more prone to experiencing parenting stress. As for depression, parenting stress in fathers has yet to be examined in depth, and it is unclear what determines stress in fathers and how this differs from mothers.

This thesis aimed to study a NZ sample of fathers to explore the effects of paternal depression on parenting behaviour and parenting stress and to examine its relationship to children's emotional, behavioural, cognitive and physical functioning. The relationship was tested in a community sample and a clinical sample of parents of infants who were born in the neonatal intensive care unit (NICU) and controls. In addition, the determinants of parenting stress were studied and gender role differences identified.

The results showed that paternal depression was related to child emotional and behavioural functioning but this result did not apply to the clinical sample tested in this thesis and only applied to the youngest or only child in each family in Study 2. Paternal depression was not associated with poorer child cognitive or physical functioning. Maternal depression was not related to child functioning on any domain. A significant relationship was identified between depression and parenting behaviour and parenting stress. Depressed fathers reported the usage of dysfunctional parenting behaviours significantly more often, and

psychopathology in either parent was associated with greater parenting stress levels. Fathers experienced similar levels of parenting stress than mothers. Depression and anxiety were the strongest predictors of parenting stress in fathers and mothers, followed by marital satisfaction, social support and work. Child functioning did not predict stress in parents.

The results showed that paternal depression can have an impact on their children's emotional and behavioural functioning. Future studies need to examine the relationship between paternal depression, parenting and child functioning over time, in a larger sample of NZ fathers, including further variables such as expressed emotions. The recognition of paternal depression needs to be improved in clinical practice, for example by using gender-sensitive assessment tools. Moreover, fathers seem to be more similar than different to mothers when it comes to the experience of parenting stress and thus, parenting support should be offered to both parents.

Preface

The quantitative data for this thesis has come from three studies. The first empirical study (Study 2 in this thesis) was a cross-sectional study, which used an online survey design created by the author of this thesis. The survey was available from March 2015 to May 2016. The aim of this study was to explore NZ fathers' perceptions of how depression affects their role as a father, and whether they perceive the depression has an impact on their parenting behaviours and their children. Additionally, the role of anxiety, marital satisfaction, family functioning and work status in relation to paternal depression and emotional and behavioural child functioning was considered.

The data for studies 4 – 6 of this thesis was taken from the Parents study (Psychosocial Adjustment RElated to Newborn Trauma; parents data) and the companion study named the Footprint study (FOLLOW up Of Tiny PReterm Infants Now Two). The aim of the original longitudinal studies was a follow-up of the infants and parents of infants admitted to a regional neonatal intensive care unit (NICU) compared with controls. The data was used in this thesis to examine the relationship between depression, parenting stress and child functioning in fathers as compared to mothers (Study 4), and to examine the predictors of paternal and maternal parenting stress using path analysis (Study 5 and Study 6). The author of this thesis did not have any involvement with the planning and data collection of these studies. However, the research questions, selection of data, data preparation for thesis studies and all data analyses including the path model analyses were conducted independently by the researcher, with initial guidance provided by Joseph Boden for chapter 8.

Articles Arisen From This Thesis to Date

Gerken, G., Carter, J.D., Mulder, R.T., Boden, J.M., Darlow, B.A., Henderson, J. (in submission). Testing a Model on the Determinants of Parenting Stress: Do Fathers Differ From Mothers? Journal of Child and Family Studies.

Copy of Co-Authorship

Deputy Vice-Chancellor's Office
Postgraduate Office



Co-Authorship Form

This form is to accompany the submission of any thesis that contains research reported in co-authored work that has been published, accepted for publication, or submitted for publication. A copy of this form should be included for each co-authored work that is included in the thesis. Completed forms should be included at the front (after the thesis abstract) of each copy of the thesis submitted for examination and library deposit.

Please indicate the chapter/section/pages of this thesis that are extracted from co-authored work and provide details of the publication or submission from the extract comes:

Chapter 8

Please detail the nature and extent (%) of contribution by the candidate:

The candidate wrote the text and conducted the data analysis. Co-authors were involved for the data collection, gave support with some analyses and feedback on the text. 90% contribution by the candidate

Certification by Co-authors:

If there is more than one co-author then a single co-author can sign on behalf of all

The undersigned certifies that:

- The above statement correctly reflects the nature and extent of the PhD candidate's contribution to this co-authored work
- In cases where the candidate was the lead author of the co-authored work he or she wrote the text

Name: A/Prof Joseph M Boden

Signature:

A handwritten signature in blue ink, appearing to read 'Joseph M Boden'.

Date: 11.9.17

Alphabetical List of Key Abbreviations Used in This Thesis

A.A.:	Adequately addressed
APA:	American Psychiatric Association
B:	Behavioural problems
BSID:	Bayley Scales of Infant Development
CESD:	Centre for Epidemiologic Studies Depression Scale
CFI:	Comparative Fit Index
CRD:	Centre for Reviews and Dissemination
CIDI:	Composite International Diagnostic Interview
CR:	Child report
D/A:	Depression/anxiety
DAS:	Dyadic Adjustment Scale
DSM:	Diagnostic and Statistical Manual of Mental Disorders
E:	Emotional problems
FR:	Father report
GF-FAD:	General Functioning Scale of the Family Assessment Device
HA:	Harm avoidance
HADS:	Hospital and Anxiety Scale
M:	Mean
MC:	Maternal care
MDD:	Major Depressive Disorder
MDI:	Mental Development Index
MDI-SD1:	Children with a MDI of at least 1SD under the norm
MDI-SD2:	Children with a MDI of at least 1SD under the norm
MP:	Maternal protection

MR:	Mother report
NA:	Not addressed/not available
NICU:	Neonatal intensive care unit
N.S.:	Not significant
NZ:	New Zealand
OC:	Oldest child
PBI:	Parental Bonding Instrument
PC:	Paternal care
P.C.:	Poorly covered
PDD:	Postpartum Depression
PDI:	Physical Development Index
PDI-SD1:	Children with a PDI of at least 1SD under the norm
PDI-SD2:	Children with a PDI of at least 2SD under the norm
PS:	Parenting Stress
PSI (-SF):	Parenting Stress Index (-Short Form)
PP:	Paternal protection
RMSEA:	Root Mean Squared Error of Approximation
SD:	Self-directedness
<i>SD</i> :	Standard deviation
SDQ:	Strengths and Difficulties Questionnaire
SRMR:	Standardized Root Squared Residual
TCI:	Temperament and Character Inventory
TR:	Teacher report
W.C.:	Well covered
YC:	Youngest or only child

Introduction

Background

Fathers play an important role in children's lives. For many years, fathers' primary role was perceived as being the breadwinner of the family; however, researchers have urged us to see the father as not only the economic provider, but also as an emotional partner and a parent (Lamb, 2010). Fathers have become much more involved in childcare over the last few decades (Lamb, 2010), and the benefits of this - such as better social, emotional and psychological child functioning - have been widely demonstrated (Falceto, Fernandes, Baratojo, & Giugliani, 2008; Potter & Carpenter, 2008; White, Brotherson, Galovan, Holmes, & Kampmann, 2011). However, fathers' increased involvement also means that children are more exposed to the emotional conditions of their fathers, including common mental health problems such as depression. Depression is the most common mental illness, affecting approximately 350 million people worldwide (World Health Organization, 2016). Depression can have a severe impact on all areas of functioning in the individual (Ainsworth, 2000). Extensive research has been conducted on maternal depression, whereas paternal depression remains an understudied topic; current research is limited, often out-dated and leaves many questions unanswered. For example, researchers have suggested that men express depression differently than women, but little is known about how these symptoms impact on a man's fathering role and their children. In contrast, there have been a large number of research studies examining the impact of maternal depression on children. It is clear that children of depressed mothers experience more difficulties than children of healthy mothers, such as cognitive, social, psychological and behavioural problems (Knitzer, Theberge, & Johnson, 2008; Kurstjens & Wolke, 2001). It has been suggested that parenting behaviour and parenting stress may have a negative impact on the relationship from maternal depression to

child functioning. For example, depressed mothers seem to show more dysfunctional parenting behaviours, which have been found to be associated with higher levels of behaviour problems in their children (Eichler et al., 2017). Researchers have also suggested that parenting stress may impact on child functioning; children of mothers who experience more parenting stress show greater levels of internalising problems (Melis Yavuz, Selcuk, Corapci, & Aksan, 2017). It remains unclear if the same pattern applies for children of depressed fathers, as only a few studies around the world have examined the relationship between paternal depression and child functioning (e.g., Ramchandani et al., 2011). There is also a dearth of research examining whether depression in fathers is associated with greater parenting stress, and if paternal parenting stress and a greater use of dysfunctional parenting behaviours affect their children. To date, no study has been conducted on this topic in New Zealand.

Central Aims of This Thesis

This thesis aims to examine the relationship between paternal depression, parenting, and children's emotional, behavioural, cognitive and physical functioning. It aims to explore if there is a direct relationship between depression and child functioning. This thesis also attempts to examine if depressed fathers use more dysfunctional parenting behaviours and whether these are associated with poorer child functioning. The relationship between paternal depression and parenting stress will be reviewed, and its relationship to child functioning examined. Another aim is to investigate the determinants of paternal parenting stress. Gender differences in depression, parenting stress and its relationship to child functioning will be identified and examined.

Overview of This Thesis

Figure 1 (p. 14) presents a conceptual overview of this thesis. It was sought to outline the characteristics of depression in fathers and mothers first. Whilst the focus lies on paternal depression, anxiety was included as it is a highly comorbid diagnosis. Mothers were included to identify gender differences. The relationship between depression and child functioning on the four domains outlined above was studied using an adapted version of Belsky's (1984) parenting model. As part of this, the role of parenting behaviours and parenting stress in this relationship was examined. Different sample groups (community vs. clinical) were included to study their unique effects. An overview of the chapters is presented in the following:

Chapter 1 presents an overview of different forms of depression and includes prevalence rates, the assessment of depression, as well as describing risk factors, comorbidities and gender differences. This chapter sets the background for chapter 2, which systematically reviews depression in mothers and in fathers, in terms of characteristics, prevalence rates and risk factors for depression specifically experienced by parents. Chapter 3 presents different theoretical explanations that account for how parents contribute to their children's functioning and how this might differ if a parent experiences depression. In this chapter, the findings of previous reviews and meta-analyses on the functioning of children of depressed parents are outlined and critiqued. Belsky's (1984) model of parenting is discussed and adapted to provide a framework for this thesis, to examine the relationship between paternal depression, parenting behaviour and stress, and child functioning.

Study 1, presented in chapter 4, is a systematic review of the relationship between paternal depression and child emotional and behavioural functioning. It provides an updated review of the literature on this topic that addresses the limitations of previous reviews. This

review also has a more specific focus on paternal depression compared to previous research reviews, and provides a systematic quality rating of the studies. The theoretical findings of the previous chapters are then used to guide Study 2 (chapter 5). Study 2 reports findings from a quantitative survey exploring New Zealand fathers' perceptions on how their mental health affects their parenting behaviours and their children's functioning in a community sample. The relationship of paternal anxiety, marital satisfaction and family functioning to paternal depression, parenting behaviour and child functioning are also examined in Study 2.

Additionally, parenting stress has been suggested by previous research studies as a variable, which may affect the relationship between depression and child functioning, with greater levels of parenting stress being related to poorer child functioning. As no review had been conducted to date on the relationship between paternal depression and parenting stress, a comprehensive literature review of this relationship in community and clinical samples is presented in chapter 6 (Study 3). Gender role differences in the levels of parenting stress are identified and the relationship between paternal anxiety and parenting stress are also considered. In Study 4 (chapter 7) the relationship between depression and anxiety in fathers compared to mothers, and their relationship to parenting stress and children's cognitive, physical, emotional and behavioural functioning is examined in a high-risk clinical sample. Data collected previously from a sample of parents of infants born in the neonatal intensive care unit (NICU) and parents of term-born infants is used for the examination of this study (Study 4) and the following two studies.

Both previous research studies, and Belsky's (1984) model of parenting, suggest that other factors in addition to depression determine parenting stress. Thus, the aim of Study 5 (chapter 8) is to examine the determinants of parenting stress in fathers, and to compare these to the contributors of parenting stress in mothers to identify possible gender differences. As

the child's developmental status might also be an important predictor of parenting stress, Study 6, presented in chapter 9, examines whether the child's cognitive and physical functioning has an impact on parents' parenting stress two years after birth.

The aim of the last chapter (10) is to summarise and integrate the findings of this thesis in the context of the adapted Belsky model used for the examination of the relationship between depression, parenting and child functioning and to summarise gender differences. Furthermore, strengths and limitations of this thesis are discussed. Implications for clinical practice and directions for future research are also provided.

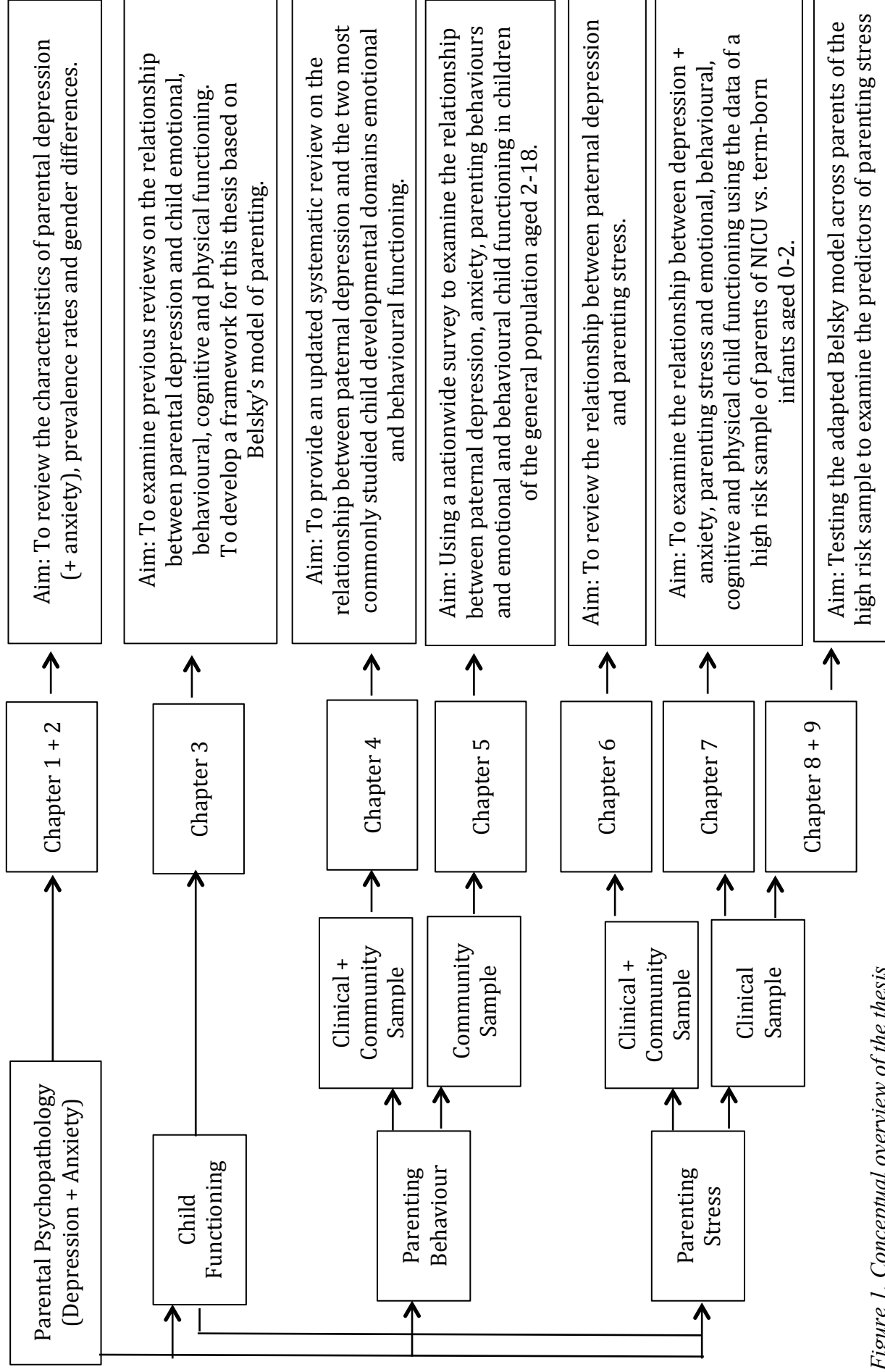


Figure 1. Conceptual overview of the thesis

Chapter 1: The Characteristics of Depression and General Gender Differences

To set the background for examining depression in fathers compared to mothers, this chapter reviews different forms of depression, prevalence rates and gender differences in depression. The assessment of depression and possible risk factors for the development of depression are also considered.

Defining Depression

According to the American Psychiatric Association (APA, 2013), depression is not a single disorder but a group of disorders including “disruptive mood dysregulation disorder, major depressive disorder (including major depressive episode), persistent depressive disorder (dysthymia), premenstrual dysphoric disorder, substance/medication-induced depressive disorder, depressive disorder due to another medical condition, other specified depressive disorder, and unspecified depressive disorder” as listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013, p. 155). In the following, the three most commonly studied forms of depression, major depressive disorder, dysthymia and depressive symptoms are described.

Major Depressive Disorder (MDD)

MDD is defined in the DSM-5 as a combination of symptoms (five or more) that someone experiences nearly every day for at least two weeks and that presents a change to previous functioning: symptoms include depressed mood, loss of interest in activities, weight loss/gain or decrease/increase in appetite, insomnia/hypersomnia, psychomotor agitation/retardation, fatigue, feelings of worthlessness/guilt, difficulty concentrating and suicidal ideation. Depressed mood or loss of interest has to be one of the symptoms present. These symptoms need to cause significant distress or impairment of the individual's normal life for a diagnosis to be given. In addition, the symptoms cannot be caused by a medical condition. To distinguish from other disorders, the DSM-5 also set exclusion criteria which mean that the symptoms cannot be explained by another psychological disorder and that there is no presence of mania (APA, 2013). The onset of MDD can occur at any time but the highest likelihood appears to be in puberty (APA, 2013). The course can also vary between individuals; MDD can occur as a single episode or recurrent episode, and be classified as mild, moderate or severe depending on the number and severity of symptoms and impairment.

The prevalence rate for MDD varies from country to country. Bromet and others (2011) conducted a study comparing prevalence rates of MDD in 18 countries who participated in the World Mental Health Surveys (Kessler et al., 2008). They reported that the lifetime prevalence rates varied between 6.5% (Shenzhen, China) and 21.0% (France). Japan was reportedly the country with the lowest 12-month prevalence rate (2.2%) and the highest rate was found in Sao Paulo, Brazil (10.4%). According to Bromet et al.'s (2011) review the lifetime prevalence rate for MDD in New Zealand for adults is 17.8% and the 12-month prevalence 6.6%, indicating that New Zealand is the country with the fourth highest rate for depression worldwide (out of the 18 countries included in the study). Comparing only high-income countries does not improve this result: New Zealand (17.8%) is in third position for

the highest MDD rates after France (21%) and the Netherlands (17.9%) and well above the average of 14.6% for high-income countries. However, the original study (Oakley Browne, Wells, & Scott, 2006) that Bromet et al. (2011) cited also included 16 to 18 year olds and as a result the prevalence rates differ from those reported by Bromet et al. (2011). Oakley Browne et al. (2006) reported the following prevalence rates: 16% for lifetime MDD and 5.7% 12-month prevalence. Regardless of the sample composition used, the results show that a large number of people experience MDD in New Zealand and the prevalence rate is substantially higher than in many countries worldwide. The prevalence rates for depression have even increased over the last few years. The Ministry of Health in New Zealand (2013) reported that the prevalence rate for 'common mental health disorders' (depression, bipolar, anxiety) has increased from 12.7% in 2006/07 to 16.3% in 2012/13. No distinction was made between depression, bipolar and anxiety disorder and consequently it remains unclear how much the prevalence rate for depression only has increased. An approximate 2:1 gender ratio for MDD with higher rates for women has been reported by many studies worldwide. For instance, Bromet et al. (2011) noted that 15 out of 18 studies that participated in the World Mental Health Surveys reported that women experience depression approximately twice as often than men. The authors explained that in the remaining three studies women also experienced higher levels of depression than men, however to a lesser degree than the noted 2:1 gender ratio. In New Zealand the lifetime prevalence for major depression is 20.3% for women and 11.4% for men, and for dysthymia 2.6% for women vs. 1.6% for men (Oakley Browne et al., 2006). As aforementioned, there has been a significant increase in individuals who have been diagnosed with a mood disorder such as depression, anxiety and bipolar disorder since 2006 in New Zealand, with an increase from 10.1% to 12.6% for men and 15.1% to 19.9% for women (Ministry of Health, 2013).

Studies found mixed results considering the age of onset of MDD. For example, Bromet et al. (2011) reported a mean of 32 years for MDD. The World Health Organization (2012) stated the onset of MDD lies between 15 and 44 years. Gilmer et al. (2007) found that earlier age onset of major depression appears to be associated with more impairment (i.e., lower quality of life). In terms of remission rates, it has been reported that most people recover from an episode of depression within a year (Richards, 2011). However, the risk for future episodes of depression lies at approximately 30% (Richards, 2011), making MDD a chronic and/or relapsing disorder for many people. Frequent comorbidities are substance-related disorders, anorexia nervosa, bulimia nervosa, obsessive-compulsive disorder, panic disorder and borderline personality disorder. The strongest comorbidity has been reported for anxiety disorders with approximately 50% of individuals who experience depression also fulfilling the criteria for an anxiety disorder (Fava et al., 1997). Anxiety disorders describe a group of disorders characterised by the symptoms of fear and anxiety that are excessive, not age appropriate and cannot be explained as being the cause of legal or illegal drugs, nor by another medical condition or psychological disorder (APA, 2013). The DSM-5 distinguishes between different forms of anxiety, such as Generalised Anxiety Disorder and Social Phobia. The lifetime prevalence for any anxiety disorder in New Zealand is 24.9%; 19.9% of men and 29.4% of women are affected in New Zealand (Oakley Browne et al., 2006).

Persistent Depressive Disorder (Dysthymia)

To diagnose dysthymia an individual has to be in a depressed mood for most of the day and on the majority of days for at least two years. They also have to experience at least two of the following symptoms: poor appetite or overeating, insomnia or hypersomnia, low energy or fatigue, low self-esteem, poor concentration or difficulty making decisions, and/or feelings of hopelessness which cause a significant impairment of the individual's functioning.

According to the DSM-5 the individual cannot be symptom free for more than two months at a time. As with MDD, different exclusion criteria are listed such as mania, schizophrenia or a medical condition, and the severity and other aspects can be specified. Charlson, Ferrari, Flaxman, and Whiteford (2013) reviewed period prevalence rates of 38 studies from 30 countries and reported that the prevalence rate for dysthymia across the studies was 1.8%. The lifetime prevalence in New Zealand is 2.1%, with women being 1.6 times more likely to be affected (Oakley Browne et al., 2006). Considering the 12-month prevalence, 1.1% of New Zealanders experienced dysthymia, of which 1% were men and 1.3% were women. This rate is lower than the worldwide average as reported by Charlson et al. (2013), suggesting that New Zealanders experience dysthymia less often. As stated in the DSM-5 (APA, 2013) comorbidities occur more frequently in individuals with dysthymia than MDD. The most common comorbid disorders are anxiety disorders and substance use disorders.

The onset of dysthymia is often early (<21 years) and the course as implied chronic (APA, 2013). However, both MDD and dysthymia can occur at any stage in life. Similarly to MDD, Sansone and Sansone (2006) found that individuals who experience early onset dysthymia (<21 years) reportedly show lower psychological resilience, were at a higher risk to experience comorbid disorders, and early onset dysthymia was reported to be more difficult to be treated effectively.

Depressive Symptoms

In addition to clinical levels of depression as stated above, many researchers have focussed on individuals or groups of people experiencing depressive symptoms, but who may not meet all the criteria for MDD or dysthymia, and therefore experience symptoms under the threshold for a clinical diagnosis. It is expected that the prevalence rates for subthreshold

depression are even higher than for clinical levels of depression (e.g., Goldney, Fisher, Dal Grande, & Taylor, 2004). Rodríguez, Nuevo, Chatterji, and Ayuso-Mateos (2012) reviewed studies examining subclinical levels of depression and reported prevalence rates ranging from 1.3% to 17.2%. A New Zealand study (Fergusson, Horwood, Ridder, & Beautrais, 2005), examining MDD vs. subthreshold vs. asymptomatic depression, found that 7.3% of their sample experienced subthreshold depression (18.4% MDD, 74.4% asymptomatic). Individuals experiencing subthreshold depression at age 18 were significantly more likely to experience MDD and report suicidal tendencies at age 25 years (Fergusson et al., 2005). In comparison to healthy individuals, subclinical levels of depression are associated with higher functional impairment, more psychological distress, lower quality of life, and more absenteeism from work (Rodríguez et al., 2012). One of the studies (Howland et al., 2008) reviewed by Rodríguez et al. (2012) highlighted that patients with subclinical depression had the same level of impairment as patients with MDD. In support of this, Judd and colleagues reported that not only MDD but also depressive symptoms below the threshold may have a severe impact on the individual and people around them (Judd, Rapaport, Paulus, & Brown, 1994). Some researchers (e.g., Forsell, 2007) suggested that individuals experiencing depression move back and forth between major depressive disorder and subthreshold levels over time. As a consequence, researchers need to be aware that individuals, who show mild levels of depression at one assessment point, may report clinically significant levels of depression at another assessment point. The symptoms of depression, such as depressed mood, are present in all three forms of depression; it is only the quantity, severity, and chronicity of symptoms that distinguishes depressive symptoms only from MDD and dysthymia.

In summary, depression is a mental health disorder that can have a severe impact on the individual's functioning. Lifetime prevalence rates in New Zealand were reported to be

16% for MDD and 2.1% for dysthymia. The age of onset varies across studies; a mean of 32 years was reported for MDD and general ‘mood disorders’ in a New Zealand sample (Oakley Browne et al., 2006). A distinction can be made between MDD, dysthymia and depressive symptoms based on the quantity, severity and chronicity of depressive symptoms. However, given that the symptoms are present in all three forms, and that these are the focus here for the purpose of this thesis, the term depression will be used for all three forms for simplification unless otherwise specified.

Assessment of Depression

Different methods are used for the assessment of depression, which can be categorised as clinical interviews and self-reports. Clinicians often use a combination of both to diagnose a depressive disorder in an individual.

Clinical Interviews

Clinical interviews are structured or semi-structured interview guides aimed to detect a number of axis 1 disorders as outlined in the DSM-5 (APA, 2013). Clinical interviews are typically conducted by mental health professionals and are valid as an assessment tool to make a clinical diagnosis (Gotlib & Hammen, 2009). In some cases clinicians need to complete training, including having experience in the coding process, before being eligible to administer the interview (WHO, 2017). A variety of clinical interviews have been developed with some commonly used examples including the World Mental Health Composite International Diagnostic Interview (CIDI; Robins et al., 1988) and the Structured Clinical Interview for DSM-4 Axis I Disorders (SCID; First, Spitzer, Gibbon, & Williams, 1996; 2002a; 2002b). As the name implies, the SCID was designed in relation to the DSM-4 and assesses all criteria outlined in the DSM-4, whereas the CIDI is linked to the International

Classification of Diseases (ICD-10; World Health Organisation, 1993). Both interviews have been translated into many languages and have proven to be highly reliable in providing a diagnosis and degree of severity of depressive disorders (Shimoda, Inoue, Tsuno, & Kawakami, 2015; Zannarini & Frankenburg, 2001).

Self-Report Questionnaires

Self-report questionnaires are completed by the individual. An enormous number of self-report questionnaires have been published for the assessment of depression (Gotlib & Hammen, 2009). They are generally used to assess the quantity and severity of depressive symptoms using a set of questions and given answers for individuals to choose from on a Likert scale or in a dichotomous yes/no format. Some of the most commonly used self-reports for the assessment of depression include Beck's Depression Inventory (BDI/BDI-II; Beck, Ward, Medelson, Mock, & Erbaugh, 1961; Beck, Steer, & Brown, 1996), the Centre for Epidemiologic Studies Depression Scale (CESD/CESD-R; Radloff, 1977; Eaton, Muntaner, Smith, Tien, & Ybarra, 2004) and the Hospital and Anxiety Scale (HADS; Zigmond & Snaith, 1983). All of these have shown good to excellent psychometric properties in a range of populations (e.g., community samples vs. clinical samples).

Both self-reported questionnaires and clinical interviews present advantages and disadvantages. Clinical interviews provide a more detailed assessment, which not only provides a diagnosis of depression, the level of impairment etc. but also aids with the identification of comorbid disorders. However, clinical interviews can only be conducted by trained clinicians, which can create barriers, e.g., it creates costs, and clinical interviews frequently take more time than self-report questionnaires (Joiner, Walker, Pettit, & Perez, 2005). Apart from the benefit of a shorter assessment time, self-report questionnaires can

often be completed without assistance, giving the individual more flexibility as to where and when to complete the assessment, and reducing assessment costs. Some self-report questionnaires can be accessed online and completed free of charge (e.g., CESD-R). However, this poses the risk of individuals completing the assessment but not being linked to health practitioners at the same time, who could offer support or refer the individual to a specialist if needed. Due to the compactness of self-report questionnaires, it could also be the case that they might not cover all symptoms of depression an individual might experience. Clinical interviews seem to be the gold standard for the assessment of depression (Joiner, Walker, Pettit, Perez, & Cukrowicz, 2005). However, a significant number of studies have found high levels of agreement between a diagnosis derived via a clinical interview and self-report questionnaires (e.g., Hanington, Heron, Stein, & Ramchandani, 2012). Löwe, Kroenke, Herzog, and Gräfe (2004), for example, compared the results of the Patient Health Questionnaire-9 (PHQ-9) and its sensitivity to change with depression status derived via the SCID, and reported that the results of the PHQ-9 and SCID were comparable. Gotlib and Hammen (2009) and Joiner et al. (2005) suggested the right assessment form depends on the goal or purpose of the assessment. For example, the authors recommend clinical interviews such as the SCID for making a clinical diagnosis pre-treatment and self-reports such as the CESD-R to assess symptom severity (Gotlib & Hammen, 2009).

Summary of Known Risk Factors of Depression

The diathesis-stress model proposes that a combination of vulnerabilities (e.g., genetic, neurobiological, environmental), and acute and ongoing stressors lead to the development and persistence of psychological disorders. According to the diathesis stress model, an individual is at risk for developing depression if they have a high vulnerability and immediate stressors trigger the development of depression. Life stressors or continuous stressors appear to cause

the disorder to persist over time (Zuckermann, 1999). A great deal of research has been conducted exploring risk factors of depression. A brief summary of the risk factors for depression as listed in the DSM-5 (APA, 2013) is outlined below. Many of these risk factors as they relate to parental depression will be explored more fully in subsequent chapters.

Temperament

Temperament has been defined as the “automatic associative responses to emotional stimuli that determine habits and moods” (Cloninger, 1994, p. 226). Different temperament traits have been proposed to put individuals at risk to develop depression. Researchers have argued that negative early childhood temperament (i.e., high emotionality) is a risk factor for the development of depression in adolescence or adulthood (Bould, Araya, Stapinski, & Joinson, 2014). High levels of neuroticism are also reported to be associated with a higher risk to develop depression (Kendler, Kuhn, & Prescott, 2004). In addition, high levels of harm avoidance and pessimism have been suggested as forming a depression-prone personality type (Nyman et al., 2011).

Genetics

A wide range of biological factors have been considered by research studies, such as the role of genes in the onset of depression. Researchers have claimed that, in particular, the 5-HTTLPR gene (serotonin-transporter-linked polymorphic region), seems to be associated with depression (Laucht et al., 2009). Individuals with one or two short alleles of the gene tend to develop depression more often when exposed to significant life events (Monroe & Reid, 2008). Not all studies support this finding; for example, Risch et al. (2009) conducted a meta-analysis examining the link between the 5-HTTLPR gene, stressful life events and depression, and did not find a significant association between the gene and depression in any

of the studies in their meta-analysis. Risch et al. (2009) did report that depression was significantly linked to stressful life events, suggesting that environmental factors may play a more important role than genes. Nevertheless, the role of genes in the development of depression is evident and most would agree that a combination of nature and nurture is likely (Risch et al., 2009).

Environmental Factors

A wide range of environmental factors has been suggested for the development of depression, such as the loss of a loved one or the exposure to severe events in childhood (Committee on Depression, Parenting Practices and the Healthy Development of Children (D.P.P.H.D.C.), 2009). However, findings are inconsistent, with some studies showing a strong relationship between child abuse, as an example, and depression at a later stage (e.g., Molnar, Buka, & Kessler, 2001) and others not finding an increased risk for depression in adults who have been abused as children (e.g., Widom, DuMont, & Czaja, 2007). It can be argued that different assessment strategies and definitions/forms of abuse may have led to the different results.

Stressful life events and chronic stress have also been associated with depression. A number of events can be classified as stressful, such as the loss of a loved one through a breakup/divorce or death, natural disasters, or accidents. The risk of developing depression is five to six times higher within six months of the stressful life event (Ainsworth, 2000). The severity of an event is based on subjective experiences of the individual (Committee on D.P.P.H.D.C., 2009). Chronic stressors such as single-parenthood, marital dissatisfaction or financial difficulties have also been associated with depression (Brown & Moran, 1997). A

number of these stressors, such as marital dissatisfaction or poorer family functioning, are considered in more detail in the following chapters of this thesis.

An interactional effect of stress and depression is likely as one might affect the other. For example, people with depression have been found to have higher rates of work absenteeism and unemployment than healthy individuals or people with physical illnesses such as rheumatoid arthritis or cardiovascular disorders (Lerner et al., 2004; Oakley Browne et al., 2006). Depressive symptoms like fatigue might impact on one's ability to perform their work role (Oakley Browne et al., 2006). On the other hand, the financial burden caused by repeated sick days or unemployment can lead to individuals feeling more depressed as they feel incapable of coping with the situation.

Gender Differences in Depression

Expression of Depression

Aside from higher rates of depression in women compared to men as outlined above, there is a growing body of research suggesting that there are differences in how men and women express depression (e.g., Alexandrino-Silva et al., 2013; Carter, Joyce, Mulder, Luty, & McKenzie, 2004; Pollack, 1998). A large number of studies have reported that women are more likely to experience an increase in appetite and weight gain, whereas men tend to have the opposite; a decrease in appetite and weight loss (Frank, Carpenter, & Kupfer, 1988; Marcus et al., 2005). Women seem to be more prone to experience hypersomnia (Kornstein et al., 2000), whereas men often suffer from insomnia (Kim et al., 2015). Opposing gender findings have also been found for psychomotor behaviour, with women being described as experiencing more psychomotor retardation (Kornstein et al., 2000), whereas men report more

psychomotor agitation (Kim et al., 2015).

It is a commonly reported result that women seem to experience more internalising symptoms than men, such as anxiety, rumination and fatigue (Vredenburg, Krames, & Flett, 1986). Moreover, compared to men, women tend to cry more often (Vredenburg et al., 1986) and are more self-critical, which might explain the higher levels of self-dislike, worthlessness, and guilt in women. Men on the other hand seem to show more externalising symptoms, such as the expression of anger and are more likely to engage in risk-taking behaviour and, as aforementioned, alcohol/substance abuse (Brownhill et al., 2005; Pollack, 1998, Rice et al., 2015). Wålinder and Rutz (2001) described this as the ‘male depressive syndrome’, which is characterised by a “low stress tolerance, an acting-out behavior, a low impulse control, substance abuse, and a hereditary loading of depressive illness, alcoholism, and suicide.” (p. 3). Another male-specific expression of depression is the “masking” of their depression, through behaviours that are not typically seen as depressive symptoms, and include overinvolvement in work or substance abuse (Genuchi & Mitsunaga, 2015; Pollack, 1998). Additionally, men report a decrease in libido (Kim et al., 2015), difficulties fulfilling their role at work as usual, and worry more about their physical health than women (Vredenburg, et al., 1986). Men also seem to report more suicidal ideation than females (Marcus et al., 2005; Vredenburg, et al., 1986) and despite the higher prevalence rate for women to attempt suicide, men were found to be four times more likely to commit suicide (Murphy, 1998).

The findings are more inconsistent for somatic symptoms. For example, some authors reported that women experience somatic symptoms more often than men (Alexandrino-Silva et al., 2013; Kornstein et al., 2000; Marcus et al., 2005), whereas other studies suggested that men are more likely to report somatic symptoms (Vredenburg et al., 1986). Different constructs assessed in these studies may account for the different findings. For example,

Kornstein et al. (2000) measured anxiety/somatization as one factor, Marcus et al. (2005) assessed somatic complaints, and Alexandrino-Silva et al. (2013) described somatic symptoms as a group of somatic symptoms, some of which might be more attributable to women (e.g., weight gain). Vredenburg et al. (1986), on the other hand, assessed ‘somatic preoccupation’, which was defined as similar to the construct measured by Kornstein et al. (2000). However, grouping somatization with anxiety might have led to higher scores in women, as research suggests women are more prone to experience anxiety symptoms than men (Vredenburg et al., 1986). In addition, it should be noted that Vredenburg et al. (1986) only included 44 men in their sample; the results might be sample specific.

Research on irritability also shows a mixed picture. Whilst in the past researchers argued women are more irritable when depressed (Frank et al., 1988; Vredenburg et al., 1986), more recent studies stated that irritability is a male-specific symptom (Addis, 2008). In contrast, Alexandrino-Silva et al. (2013) could not identify a significant difference in irritability across gender. As with somatic symptoms, the gender differences might be explained by the variety of definitions and assessment tools used to measure irritability across the studies. A general critique of the studies mentioned in the sections above is that significantly more women than men were included with some of the studies including only very limited numbers of men (e.g., Frank et al., 1988; Vredenburg et al., 1986), specific samples including undergraduate psychology students (Genuchi & Mitsunaga, 2015), used retrospective data (e.g., Kim et al., 2015) and relied largely on quantitative assessments of depression, which screen for typical symptoms of depression. Some of the symptoms often experienced by men (e.g., aggression) differ from what is commonly seen as depression or required for a DSM-5 diagnosis, and as a consequence depression in men might be less recognised. Some researchers have suggested that masculinity norms might cause men to express depressive symptoms in a different way, as some cultural norms discourage men from

a young age on to suppress internalising, “vulnerable” emotions such as anxiety and sadness, and encourage the expression of externalising ones such as anger (Addis, 2008). Brownhill et al. (2005) examined the experience of depression in men using qualitative assessments. This could be seen as an advantage as it allows the researcher to identify symptoms that common assessment tools may fail to identify. However, the sample was restricted to teachers and students, participants were reimbursed for their time by receiving music vouchers, which may have attracted a specific clientele, and the participants showed no clinical symptoms of depression.

Identifying differences in how men and women express depressive symptoms may have implications for designing assessment tools and possible interventions. However, given that most research studies have focussed on maternal depression, the experience of depression in men or fathers is still less explored and consequently less understood. Despite the differences in the expression and prevalence of depression, the onset of depression, severity of the symptoms, and the time between episodes of depression seem to be the same for both sexes (Cochran & Rabinowitz, 2000). Depression also leads to a similar level of impairment across gender and thus this highlights the clinical significance of male depression.

It should be noted that the different symptoms experienced by men and women could impact on their behaviours differently. This is particularly important when considering parenting behaviours. About half the clients in adult mental health clinics are parents of dependent children (Gopfert, Webster, & Seeman, 1996). The greater level of externalising symptoms reported by men, such as alcohol abuse and the expression of anger, are likely to affect their fathering role. For example, many studies reported that fathers who consume more alcohol reported a higher usage of dysfunctional parenting behaviours including corporal punishment (Lee, Perron, Taylor, & Guterman, 2011). Corporal punishment has been

associated with more negative child outcomes such as higher rates of behavioural problems (e.g., MacKenzie, Nicklas, Waldfogel, & Brooks-Gunn, 2012). A father who expresses more anger may affect children more overtly through dysfunctional interactions with the child or – as mentioned above – corporal punishment. It can be questioned if these male specific symptoms have a larger impact on children than the more internalising symptoms experienced by women, such as rumination, which could possibly be less noticeable for children. Thus, by gaining a deeper understanding of gender differences in the experience of depression and their impact on the parental role, researchers can design support that can not only make a difference for the affected individual but also their children.

Gender Sensitivity of Depression Assessment Tools

The assessment tools outlined before, and many others, have been described as being valid for the use in both men and women. Nonetheless, a review of this literature indicates that the norms of some assessment tools rely on predominantly female samples, and consequently it can be questioned if these are appropriate for men, especially given the gender differences in the expression of depression. Moreover, many assessment tools are based on the criteria outlined by the DSM-5 and therefore exclusively assess traditional symptoms of depression. These screening tools may fail to take male-specific symptoms, such as substance abuse or risk taking behaviour, into account and consequently male depression can remain unrecognised (Martin, Neighbors, & Griffith, 2013). It is important to note that researchers that used gender-sensitive depression assessment tools, such as the Gender Inclusive Depression Scale (GIDS; Martin et al., 2013) or Masculine Depression Scale (MDS; Magovcenic & Addis, 2008), have reported similar prevalence rates for men and women (Genuchi & Mitsunaga, 2015; Martin et al., 2013). Genuchi and Mitsunaga (2015) explained that despite the fact that the MDS was designed to assess masculine depression, the

composition of externalising and internalising symptoms used in the questionnaire might allow the use for both genders, as the more traditional symptoms of depression are part of the internalising scale. The Gender Inclusive Depression Scale (GIDS; Martin et al., 2013) assesses a combination of typical and male-specific symptoms of depression and also found as many men as women could be identified as depressed when using this questionnaire. Both scales showed good psychometric properties in the initial assessments; however, they have yet to be validated by other researchers using different sample groups. Alternatively, current, common validated assessment tools could be modified to include a broader range of gender specific symptoms of depression to detect depression in men and women adequately.

Conclusion

In summary, depression is a psychological disorder that affects many people worldwide, with New Zealand being one of the countries with the highest rates of people experiencing this disorder. The majority of men and women experience their first depressive episode between the age of 15 and 44 – the age in which most people transition into parenthood (WHO, 2016). Gender differences were evident in the expression of depressive symptoms; men tended to show more externalising symptoms than women, who experienced more internalising or ‘traditional’ symptoms of depression. However, some of the findings were inconsistent in regards to which symptoms occur more often in which gender, highlighting the need for more research in this area. A common finding was that women were reported to have higher rates of depression than men, with an approximate 2:1 ratio. However, most assessment tools screened for traditional symptoms of depression and did not take male-specific symptoms into account. This could have led to depression in men being under-recognised. Researchers using assessment tools that incorporate male-specific symptoms

reported equal rates of depression across gender. The identification of gender differences is important as it can shape assessment and treatment.

Many individuals experiencing depression are parents. It is possible that the different symptoms of depression expressed by men and women may affect them differently in their role as parents. The greater level of externalising symptoms experienced by men might be more overt, and thus may affect children more than the more internalising symptoms experienced by women. This has not been addressed in research to date.

The transition into parenthood generally brings unique stressors with it. These could put parents at a particular risk of experiencing mood disturbances, such as depression. Which factors put fathers and mothers at the risk for developing depression? Hormone changes might be likely to have an effect on mothers, but do fathers experience hormone changes? Or is it the role change that men and women experience overnight when they become parents? The next chapter will consider possible risk factors and explore how the different symptoms across gender impact on men's and women's functioning in their role as parents.

Chapter 2: The Characteristics of Depression in Parents

The characteristics, prevalence rates, assessment methods and risk factors of depression in men and women in general were presented in chapter 1. While similarities in depression exist, it is also evident that there are important differences in how men and women experience and express depression. This chapter specifically focuses on parents, the characteristics of maternal and paternal depression, and known risk factors are reviewed.

Depression in Mothers

Prevalence and Characteristics of Maternal Depression

Maternal depression is defined as depression which is experienced during motherhood and may develop at different stages: prenatally, postnatally or at a later stage of motherhood, but is most commonly used to describe depression within the first year postpartum (Children's Defense Fund, 2011). Parents are likely to spend more time with their underage children, and consequently underage children are more exposed to their parents' mental health. This may lead to a stronger relationship between parental depression and child behaviour problems for underage children compared to adult children. Therefore, for the purpose of this thesis, maternal depression will be defined as occurring in mothers with children under the age of 18.

Prevalence rates for maternal depression range from 13% -25% and are at the higher end for women who live in low-income households (Horwitz, Briggs-Gowan, Storfer-Isser, & Carter, 2007; Knitzer, Theberge, & Johnson, 2008; Wang, Tiejian, Anderson, & Florence, 2011). The most studied form of maternal depression is postnatal or postpartum depression (PPD), which is defined as symptoms of depression that occur within 12 months postpartum and is experienced by 12 - 25% of new mothers (Kendall-Tacket, 2016). Underwood, Waldie, D'Souza, Peterson, and Morton (2017) reported the prevalence rate for postnatal depression in New Zealand mothers was 5%. According to Kendall-Tacket (2016), the wide-ranging prevalence rates might be partly explained by the different definitions for depression (MDD vs. depressive symptoms) and measurements used in the studies. The term maternal depression is often used interchangeably with PPD. Maternal depression is distinct from maternity blues, which is a common condition with about 80% of new mothers experiencing the blues after the child's birth (Children's Defense Fund, 2011). Maternity blues is characterised by feelings of sadness and overstraining, fatigue and sleep difficulties within the days after birth (National Institute for Health Management, 2010). What distinguishes maternity blues from PPD is not only the severity of the symptoms, but the duration and required treatment: maternity blues usually only occurs in the first two weeks post birth and often resolves without further psychological help needed, whereas postpartum depression can last substantially longer and often requires treatment (National Institute for Health Management, 2010). The DSM-5 offers no distinct diagnosis for PPD but rather describes it as MDD with a specific onset during pregnancy or postpartum. It is suggested to use the MDD specification "with peripartum onset" (APA, 2013, p.186). Aside from the symptoms of MDD, the additional symptoms noted for PPD are: severe anxiety and panic attacks. The criterion for the specifier "with peripartum onset," is onset of depression during pregnancy or four weeks postpartum, a period which has been criticised as too short by some researchers (e.g., Kendall-Tacket, 2016). Moreover, other researchers have argued that PPD includes

different or additional symptoms such as feeling negative or ambivalent about the infant or having concerns about their ability to care for the infant (Nonacs, 2005). Women with PDD might also experience “intrusive, obsessive ruminations” which can include thinking about harming the infant without intending to act on it (Nonacs, 2005, p. 5). Researchers who considered maternal depression at a later stage in motherhood typically examined traditional MDD symptoms; these symptoms may have started postnatally and persisted (chronic depression), or developed later on during motherhood (e.g., Campbell, Morgan-Lopez, Cox, McLoyd, & National Institute of Child Health and Human Development Early Child Care Research Network, 2009; O’Connor, Langer, & Tompson, 2017).

Risk Factors for Maternal Depression

Several risk factors have been reported for the onset of maternal depression; these include the possibility of a depression-gene and specific environmental stressors, such as childhood abuse or natural disasters as suggested in chapter 1. An example of a biological risk factor, specifically for maternal depression, are hormone changes before and after birth (Hendrick, Altshuler, & Suri, 1998). According to Bloch et al. (2003) not only estradiol and progesterone levels increase considerably during pregnancy, but mothers also experience a fourfold rise in cortisol, beta-endorphins and human chorionic gonadotrophins. Peaking during the birth procedure, these hormone levels immediately decline postpartum and the changes in hormone levels could be one of the causes of the development of depression (Hendrick et al., 1998).

The immediate shift in roles from working to being a fulltime mother has also been seen as a reason for the development of maternal depression (Puckering, 1989). It has been suggested that the shift in role is likely to release feelings of stress as the mother adapts to a

different lifestyle, including uncommon sleeping patterns, permanent provision of care, temporary loss of their work role and many other aspects. Moreover, some women find it difficult to stop working in their regular jobs and are now at home being “just a mother” (Puckering, 1989).

Depressed mothers have also been found to experience more parenting stress than non-depressed mothers (e.g., Cardoso et al., 2010), thereby creating a risk factor for the development of depression. In support of this, Leigh and Milgrom (2008) have reported finding parenting stress as a significant predictor of maternal depression. One of the strongest predictors for maternal depression however, is depression in the partner – most often the father of the child (Ballard et al., 1994; Paulson, Bazemore, & Goodman, 2016). There are a number of possible reasons for this; one factor could be that the mothers might feel less emotional support and support with the childcare if the father experiences depression. Other significant risk factors are a history of depression pre-motherhood, low social support, poverty and lower education (Soliday, McCluskey-Fawcett, & O’Brien, 1999; Wang et al., 2011). Moreover, Wang et al. (2011) reported that race could be seen as a predictor of depression, with women of black race experiencing depression significantly more often than women of white race. Leigh and Milgrom (2008) reported that in low self-esteem, antenatal anxiety, major life events and a history of abuse also functioned as predictors of postnatal depression.

Depression in Fathers

Prevalence and Characteristics of Paternal Depression

No official definition for paternal depression has been established. Following the

definition for maternal depression, for the purpose of this thesis the term was defined as depression that occurs during the period of fatherhood (child age <18), as it is expected that fathers spend more time with their underage children and thus they may be more affected by their father's mental health. Similar to maternal depression, the term paternal depression is primarily but not exclusively used to describe depression in men within the first year after becoming a father (e.g., Ramchandani et al., 2011). Studies reviewing prevalence rates for paternal depression show different results ranging from 1.2% to 25.5% (Goodman, 2004). A recently published New Zealand study reported a prevalence rate of 2.3% for antenatal and 4.3% for postnatal paternal depression, measured as symptoms of depression nine months post the child's birth (Underwood, Waldie, Peterson et al., 2017). Goodman (2004) found in her review that the rates of paternal depression could go up to 50% if the mother also experiences depression. However, a closer look revealed that these studies which reported high prevalence rates for paternal depression if the mothers were also depressed, included less than $n = 50$ fathers. Some of these included less than $n = 15$ males, and thus should probably be seen as case studies, which do not allow for generalisations to other populations to be made. The assessment point of postnatal paternal depression varied greatly across the studies, with assessment times reported from three days to 12 months after the infant's birth.

Some researchers have argued that the onset of postnatal depression in fathers occurs later than in mothers, with increasing rates over the first year post becoming a father (e.g., Stadtlander, 2015). Differences in prevalence rates may be explained by the different definitions used for depression, assessment times, and different samples included in the studies. For example, Davé et al. (2008) studied 365 fathers of four to six year olds and assessed depression with the PHQ. Eight percent of fathers were categorised as depressed of which 3.3% met the criteria for MDD, and 4.7% met the criteria for "other depressive symptom", indicating depressive symptoms were present but the individual did not meet the

full criteria for MDD. A substantially higher prevalence rate was found by Soliday, McCluskey-Fawcett, and O'Brien (1999) with 25.5% of fathers in their sample reporting to be depressed. Soliday et al. (1999) also used a well-validated assessment tool, the CESD-R but the sample size of only 51 fathers restricted the generalisability of their results. Moreover, the assessment time varied substantially: depression was assessed within the first month after the infants' births in Soliday et al.'s (1999) study compared to Davé's et al.'s (2008) assessment which was conducted four to six years after birth. This raises the question whether the rates for paternal depression are the highest within the first few weeks or months after birth. Davé, Petersen, Sherr, and Nazareth (2010) conducted a longitudinal study following 86,957 parents and their children from birth on for 12 years. The researchers found that the highest rates for paternal (and maternal) depression were within the first year postpartum. Depression data was retrieved in Davé et al.'s (2010) study from the Read codes, which is the classification system used to record medical information of individuals in the United Kingdom (Chisholm, 1990). The authors (Davé et al., 2010) noted that participants were classified as depressed if they had a diagnostic Read code for unipolar depression (without psychosis) and/or a prescription for antidepressants. This study has significant methodological strengths: it involved a very large sample of the general population and provided longitudinal data, both allowing generalisations to be made. However, a significant disadvantage of their method was that it remained unclear how depression was initially assessed (i.e., clinical interview, self-report, narration). Furthermore, a prescription for antidepressants alone cannot be equated with a clinical diagnosis of depression. These limitations could have had an impact on the prevalence rates reported by Davé et al. (2010).

Consistent with findings examining gender differences in the expression of depressive symptoms, Musser, Ahmed, Foli, and Coddington (2013) summarised the symptoms of paternal depression as following: depressed fathers seem to show withdrawal or avoidance of

social situations, work and their family, express more self-criticism and tend to have difficulties making decisions. These fathers might appear more irritable or cynical than non-depressed fathers and were reported to be more prone to have anger attacks. Musser and others (2013) also reported an increase in alcohol use, partner violence and marital conflict in depressed fathers.

Risk Factors of Paternal Depression

General risk factors for the development of depression such as temperamental traits, genes and environmental stressors were outlined in chapter 1. Fathers also seem to experience hormonal changes, with higher levels of cortisol before the birth and higher levels of prolactin and lower levels of testosterone after birth (Storey et al., 2000), but it remains unclear how these affect fathers' mental health, and findings are inconsistent. Edelstein et al. (2015), for example, could not find support for any changes in cortisol in fathers. Sundström Poromaa, Comasco, Georgakis and Skalkidou (2017) suggested that fathers experience fewer hormone fluctuations but these could still affect paternal depression levels.

Fathers also experience a dramatic shift in role overnight after the child's birth, which changes their whole lives and can contribute significantly to the experience of parenting stress. Parenting stress may be caused if the infant is perceived as challenging, or through aspects that affect parental functioning, such as sleep deprivation. As for mothers, the strongest predictor for paternal depression seems to be a depressed partner (Goodman, 2004); as pointed out before, the presence of a depressed partner increases an individuals' risk significantly. If the mother experiences postnatal depression, the father may have to take over substantial childcare, receiving little or no support from the mother. This could lead to feeling overburdened and stressed. Consequently, maternal depression can be seen as not only a

predisposing factor but also as a continuous stressor. However, not all studies report that maternal depression raises the prevalence rate for paternal depression (e.g., Dudley, Roy, Kelk, & Bernard, 2001). Dudley et al. (2001) noted that whilst maternal and paternal depression seem to be related, they did not turn out to contribute to each other in their regression model. However, it is to be noted that fewer than 100 fathers were involved in Dudley et al.'s (2001) study, of whom only 11 were classified as depressed.

As in the case for mothers, a personal history of depression pre-fatherhood or having a lower income increases the risk for depression in fathers (Areias et al., 1996; Nishimura & Ohashi, 2010). An additional vulnerability for paternal depression, that does not seem to apply for mothers as much, is unemployment or risk of unemployment (Ballard, Davis, Cullen, Mohan, & Dean, 1994; Ramchandani & Psychogiou, 2009). This could be explained by the social status of men as the financial provider of the family; unemployment could affect the whole family substantially. Men are likely to experience additional pressure when having to provide resources for another person, especially if they fear they might not be able to. Financial hardship is reported to generally increase rates of depression and depression appears to increase financial hardship (Williams & Cheadle, 2016).

It has been suggested that one of the vulnerabilities for paternal depression is that many men are often less prepared for fatherhood than women are prepared for motherhood (Wee et al., 2011). The transition into parenthood has historically been seen as a women-only topic, with fathers-to-be receiving little attention (Cunningham, 2000). Wee et al. (2011) emphasised that “men who had insufficient information about pregnancy and childbirth were also at risk of being distressed” (p. 375). Services pre-birth are mainly provided for women with fewer than one per cent of services being directed at fathers or fathers-to-be (Henricson, Katz, Mesie, Sandison, & Tunstill, 2001).

Conclusion

In summary, depression in parents is common with the highest rates for both, fathers and mothers, found within the first year after a child's birth. The prevalence rates vary greatly; this may be due to different assessment times of depression (e.g., immediately after birth vs. years post birth), or measurements used for the assessment of depression. Five per cent of mothers and 4.3% of fathers seem to experience postnatal depression in New Zealand (Underwood, Waldie, Peterson et al., 2017; Underwood, Waldie, D'Souza et al., 2017). The risk factors for paternal depression seem to be similar to those for maternal depression, with the strongest predictor for both parents being depression in the other partner. Unemployment seems to be a risk factor that is specific to fathers. It should be noted that some risk factors, such as hormonal changes in new fathers, have not been studied in detail yet and their impact remains unclear. Moreover, it was noted that services and written media offered insufficient information on the transition to parenthood and child rearing for fathers, resulting in fathers being left less prepared for fatherhood, which may put them at risk to experience distress. However, it can be questioned if this has changed over the last 15 years as fathers have become more involved in childcare.

A significant criticism of a large number of studies examining depression in mothers and fathers is that many researchers presented their results using terms such as 'depression in parents' or 'parental depression' despite including *only mothers*, not fathers. These studies are misleading, and 'maternal depression' or 'depression in mothers' would be more accurate and should be used to avoid attributing the findings to fathers. In this thesis, the term parental depression is only used if the findings apply to both parents to avoid making misleading conclusions and to distinguish between mothers and fathers; the importance of this was highlighted previously. Another criticism is that the results of many previous studies are

based on a small number of fathers, which makes the generalisability of the results questionable. The assessment time of paternal depression also varied greatly and it was questioned whether the rates for depression are higher in the year post birth.

Despite some symptoms that occur across gender, paternal depression often differs in its symptom profile from maternal depression, with fathers tending to express more externalising symptoms, such as anger. The expression of these symptoms in fathers may have a larger impact on children as they tend to be more overtly communicated, directly affecting the children. Before examining the impact paternal depression may have on child functioning, the factors that contribute to optimal child functioning need to be established. Some questions that need addressing include: What impact can parents have on their children's functioning and how might this differ if a parent experiences depression? Are there differences between mothers and fathers? Do children of depressed parents show poorer functioning? To answer these questions, the association between parenting, depression and child functioning will be examined in chapter 3. In addition, Belsky's model of parenting will be introduced and adapted to provide a framework for further examination of the role of depression in affecting parenting stress and parenting behaviours, particularly in fathers, and the impact on their child's functioning.

Chapter 3: Reviewing the Relationship Between Parental Depression, Parenting and Children's Functioning

This chapter reviews the literature examining the relationship between parental depression, parenting and child functioning across different developmental domains: emotional, behavioural, cognitive and physical functioning. Key theories of child development (Psychosocial Theory, Attachment Theory and Social Learning Theory) are outlined that account for the influence parents and their parenting behaviours can have on their children's functioning. The parenting behaviours that depressed parents may show are reviewed to highlight how they differ from optimal behaviours of optimal parenting. Furthermore, the results of reviews and meta-analyses conducted to date that have examined the relationship between depressed parents and children's functioning across a range of developmental domains are presented. Belsky's (1984) theoretical model of parenting is introduced and adapted based on previous research to provide a framework for examining the relationship between depression, parenting and child functioning in this thesis.

Child Functioning Across Developmental Domains: Definition and Terminology

Within the field of developmental psychology, investigators typically assess children's functioning across emotional, behavioural, cognitive and physical (psychomotor)

development domains. Researchers often assess and describe children's current functioning at a point in time and/or examine child outcomes longitudinally. Emotional functioning refers to the child's internal state and is characterised by the expression of emotions, and the ability to understand and regulate emotions (Denham, 1998). The ability to regulate emotions is strongly associated with mental well-being, such that children who have difficulties with emotional regulation appear to be at risk for the development of emotional disorders (Benson & Haith, 2009). Emotional problems in children are often manifested in internalising symptoms, including withdrawal, inhibition, anxiety or depression (Eisenberg et al., 2001). Eisenberg et al. (2001) defined behavioural functioning as the child's overt behaviour and actions in relation to his or her external environment. Examples of external behavioural problems include hyperactive, disruptive, and antisocial or aggressive behaviour patterns. The cognitive domain refers to the child's mental development and is often measured in intelligence, academic achievement and language development (Snow, van Hemel, & Committee on Developmental Outcomes and Assessments for Young Children, 2008). Physical functioning, on the other hand, is defined as the child's psychomotor development, characterized by changes over time in children's gross- and fine motor skills and current psychomotor ability (Santrock, 2014). Child development is not limited to the four domains above, however they are the most commonly studied domains within which child functioning is assessed and are therefore considered in this thesis. The term 'children' will be used in this thesis to refer to children from birth to the age of 18 years. As aforementioned, underage children are likely to spend more time with their parents than older children, thus are likely to be more exposed to the emotional conditions of their parents.

Child functioning has been assessed using a variety of methods such as parent and teacher reports, child self-report questionnaires, clinician assessments and observational methods (Bellman, Byrne, & Sege, 2013). Whereas some measures assess a range of child

outcomes such as cognitive, physical, or emotional and behavioural functioning (e.g., Bayley Scales of Infant Development, Bayley, 1993; Strengths and Difficulties Questionnaire, Goodman, 1997, 1999), others measure specific domains, such as cognitive functioning (e.g., Wechsler Intelligence Scale for Children, Wechsler, 2014).

A critical challenge for investigators in the field of developmental psychology is to understand the pathways, processes and conditions under which children can achieve optimal functioning across all four developmental domains. Parents shape their child's development through multiple pathways, such as genes, parenting behaviour and beliefs (Bornstein, 2002). The genetic contribution is substantial; however, many researchers have suggested that the environment in which children grow up (e.g., around nurturing parents) contributes at least as much if not more to child development (Bornstein, 2002). Whilst parents have no influence on their contribution to hereditary factors, they have a direct influence on their children's development through parenting practices.

Parenting is a broad term referring to the rearing of children (Bornstein, 2002). Parenting often refers to externally expressed parenting behaviours, but also includes internal processes, such as the experience of parenting stress (e.g., Abidin, 1992). Parenting stress can be defined as the experience of stress in relation to the parenting role and child-rearing activities (Abidin, 1995; Haskett, Ahern, Ward, & Allaire, 2006). Stress deriving from rearing a child often increases if the child is perceived as challenging, for example if the child displays emotional or behavioural problems (Meppelder et al., 2015). Parenting role stress refers to the impact child rearing can have on a parent's life (Le et al., 2017). An example is the sleep deprivation that many parents may experience, particularly in the first year of the child's life due to a disrupted sleep pattern and a lack of sleep. Abidin (1995) added that parenting stress can also derive from interactions with the child, for example if the child is

perceived as non-compliant. Deater-Deckard (2004) suggested that parenting stress arises if there is a mismatch between the demands of parenthood and available resources. Parenting demands refer to meeting the children's basic needs, as well as their psychological demands, such as the demand for attention, reassurance and sensitivity to the child's emotional states. Resources refer to four different resources: the psychological and physical resources of the individual, financial resources and social support (Deater-Deckard, 2004; Deater-Deckard & Scarr, 1996). Stress is primarily an internal process, but parents reaction to stress may be expressed externally, for example through parenting behaviours with parents who experience greater stress reporting a higher use of dysfunctional parenting behaviours (Deater-Deckard, 2004).

Parenting behaviours have been defined as a variety of behaviours that parents use in the interactions with their children (Lucas, Nicholson, & Maguire, 2010). Researchers have typically split parenting behaviours into positive and negative or dysfunctional behaviours: positive parenting behaviours such as responsive parenting are associated with more optimal child functioning; negative behaviours (e.g., hostility, disengagement) are associated with the risk for children to develop difficulties (Lamb, 2010).

The following major developmental theories provide an explanation of key factors and their mechanisms that contribute to a child's optimal functioning and development. These theories were selected due to their relevance for this thesis, as they consider how parenting affects child development. The literature is also reviewed to describe the parenting behaviours shown by a depressed parent such as higher levels of hostility or lower levels of emotional responsiveness, and the impact this might have on their child's functioning is considered within each of the theories.

Theories of Child Development

Psychosocial Theory. Erikson's psychosocial theory proposes that optimal child functioning is achieved through positive interactions with the social environment, such as the parents (Erikson, 1950). According to Erikson children need positive reinforcement, as well as a caregiver who shows consistent behaviour and stimulates children to initiate activities and form friendships (Heffner, 2001). According to this theory, the amount of time parents spend with their children can affect children's functioning significantly. In support of this claim, mothers who reported spending more time in joint activities with their children, have children who show a better tendency to regulate their emotions (Alegre, 2012). Furthermore, paternal involvement in childcare is strongly associated with better child outcomes: Increased paternal involvement leads to better emotional, cognitive and behavioural outcomes in children (Lamb, 2010), and it may have long-term effects. For example, Koestner, Franz and Weinberger (1990) found that the quantitative amount of paternal involvement in childcare during childhood was most strongly associated with empathic concern in adults 26 years later. Lamb (2010) argued that the qualitative aspect of involvement shapes child development, rather than the quantity of time fathers spend with their children. However, the quality of involvement can be problematic to measure in research studies. Lamb refers to how engaged fathers are when interacting with their children when considering the qualitative aspects of involvement (Lamb, 2010).

The qualitative aspect of parental involvement may be impaired if a parent experiences depression. Considering Erikson's (1950) psychosocial theory, the anxious behaviour, isolation, lower engagement, lack of encouragement and support often observed in depressed parents might prevent the completion of the child's developmental stages and lead to negative outcomes (Mattejat & Remschmidt, 2008; Committee on D.P.P.H.D.C., 2009). That is, depressed parents might not have the resources to provide positive interactions consistently,

which assist in achieving optimal developmental outcomes. Lovejoy (1991), for example, compared the parent-child interactions of depressed and non-depressed mothers and found that depressed mothers' interactions were more negative and were characterised by yelling, crying, ignoring the child and threatening. Depressed mothers were observed to use a more negative affective tone in their interactions, criticise their children more often and have more negative perceptions of their children than non-depressed mothers (Goodman, Adamson, Riniti, & Cole, 1994; Nolen-Hoeksema, Wolfson, Mumme, & Guskin, 1995). All of these behaviours are much more likely to result in patterns of negative parent-child interactions, and would prevent opportunities for optimal child functioning as suggested by Erikson (Goodman, Adamson, Riniti, & Cole, 1994; Nolen-Hoeksema, Wolfson, Mumme, & Guskin, 1995). Depressed fathers have also been found to express less verbal and behavioural stimulation when interacting with their child (Sethna et al., 2015), which could be associated with poorer child functioning. Erikson's (1950) psychosocial theory supports the idea that consistency in parents' behaviour, such as consistently showing warmth, contributes to optimal child functioning. Depressed fathers, however, are reported to show more inconsistent parenting behaviours, such as using discipline inconsistently than non-depressed fathers (Dette-Hagenmeyer & Reichle, 2014). This may affect child functioning as it makes the father's behaviour seem unpredictable and does not provide stability that can support optimal child development.

Attachment Theory. Attachment theory proposes that children are biologically driven to get attached to people to increase their ability to cope in the world and to assure protection (Bowlby, 1958). Secure attachment of a child is formed through a responsive parent, who fulfils the core needs of love, feelings of security, as well as physical and emotional nurturing (Bowlby, 1958). Children whose mothers appear more affectionate towards their infants, and thus fulfil Bowlby's core need of love, have better cognitive and language skills at two years

of age (Olson, Bates, & Bayles, 1984) and showed lower levels of emotional distress when they are adults (Maselko, Kubzansky, Lipsitt, & Bulka, 2011). Barnard and Martell (1995) support Bowlby's statement that responsiveness of a parent is crucial for achieving optimal child functioning and developmental outcomes across all domains. The authors explained that responsiveness supports the building of trust and helps children to develop a healthy understanding of the world (Barnard & Martell, 1995). Holmbeck, Paikoff, and Brooks-Gunn (1995) describe how parents of adolescents who set clear expectations around appropriate behaviour, whilst showing warmth and responsive parenting towards their teenage children, appear to have adolescents with fewer adjustment problems. Children also need positive interactions with their attachment figures to become securely attached (Fahlberg, 2011). Insecure attachments are often considered as one of the main causes for psychological difficulties during later childhood (Pielage et al., 2000).

It has been postulated that depressed parents might be less likely to have the capability to fulfil some attachment needs that may influence a child's ability to form a secure attachment (Department of Health & Human Services, State of Victoria, 2007). Ferketich and Mercer (1995) reported that paternal depression was a strong predictor of poorer father-child attachment. As described previously, depressed fathers and mothers tend to have fewer positive and more negative interactions with their infants (e.g., Jacob & Johnson, 2001; Sethna, Murray, & Ramchandani, 2012). Depressed mothers also seem to be less responsive to their children when they were in distress (Shaw et al., 2006). Depressed fathers show less warmth towards their children (Cummings, Keller, & Davies, 2005; Eiden, Edwards, & Leonard, 2007). Depressed fathers also appear to be more withdrawn, have less contact and are less engaged with their children than non-depressed fathers (Davis, Caldwell, Clark, & Davis, 2009; Sethna, Murray, Netsi, Psychogiou, & Ramchandani, 2015). Depressed fathers report lower levels of their monitoring and closeness to their children than non-depressed

fathers (Davis et al., 2009). These characteristics reflect the symptoms of paternal depression discussed in chapter 2, characterised by withdrawal or avoidance of family situations. In sum, depressed parents may find it difficult to show positive parenting behaviours required to form a secure attachment, such as being responsive to the child's needs and thus parental depression may lead to child insecure attachment.

Social Learning Theory. Social learning theory proposes that behaviour is learned through observation and modelling (Bandura, 1977). Bandura (1977) reported that children model significant others and thus develop a concept of themselves and their world, which supports their development. Bandura noted that children learn most from the immediate people they spend most time with, as they can repeatedly observe them and thus imitate their behaviours; these are often the parents. Social learning theory also suggests that children need positive reinforcements from others. Children are prone to develop a negative self-image, and find it difficult to gain self-confidence, if positive reinforcements are not provided (Flora, 2004). Positive reinforcement can also be used to increase the occurrence of these behaviours (Bandura, 1977).

Depressed parents often provide little or no positive reinforcements, such as comments that reinforce the child's self-esteem (Mattejat & Remschmidt, 2008). Research indicates that depressed mothers are likely to model a dysfunctional concept of the world through expressing sadness and anxiety, as well as a lack of interest in activities and the environment (Puckering, 1989). In addition, the interactions between depressed mothers and their infants have been characterised by flatness of affect, intrusiveness and increased hostility, all of which are behaviours that children might copy from their mothers (Caughy, Huang, & Lima, 2009; Field, Healy, Goldstein, & Guthertz, 1990; Lyons-Ruth, Zoll, Connell, & Grunebaum, 1986). Gelfand and Teti (1990) explored underlying mechanisms of risk transmission from a

depressed mother to their children in their review. Consistent with social learning theory, the authors proposed that children could be at risk to develop difficulties due to modelling their mothers' depressed behaviours, facial expressions and attributions. In addition, the lower amount of positive reinforcements and lack of consistent behaviours could also put children at risk for developing difficulties like emotional or behavioural problems (Gelfand & Teti, 1990). Theoretically, a similar pattern of risk transmission could be expected for fathers, as levels of expressed anger and criticism are common externalising symptoms of paternal depression. Research on paternal parenting behaviours shows that depressed fathers seem to be more intrusive and hostile, and experience more conflicts with their children (Conger, Ge, Elder, Lorenz, & Simons, 1994; Davis et al., 2009). They express more anger, and are more likely to get frustrated when their infants are distressed than non-depressed fathers (Lyons-Ruth, Zoll, Connell, & Grunebaum, 2002; Renk et al., 1999). Depressed fathers are reported to spank their children significantly more often than non-depressed fathers (Davis, Davis, Freed, and Clark, 2011). As aforementioned, researchers have found an increased risk for partner violence in depressed fathers; Davis et al.'s (2011) findings suggest that violent behaviour might also be transferred to other family members. Studies showed that children who are exposed to more anger express more anger themselves (Bandura et al., 1977). The observation of parental anger can also lead to low self-esteem, feelings of helplessness, and shame, as children often perceive themselves as the cause of the anger and might not be able to stop it (Grych & Fincham, 1993).

To summarise, the overview of the major theories of child development suggests that depression in a parent is likely to negatively impact on child outcomes. Depressed parents are shown to engage in greater levels of dysfunctional parenting behaviours including hostility, the absence of positive reinforcements, and interactions that are characterised by negativity.

To evaluate the hypothesis that parental depression is associated with poorer child functioning, the reviews and meta-analyses conducted to date examining the relationship between child functioning and depression in a parent will be presented in the next section. This chapter describes findings from reviews and meta-analyses on this topic as they offer a qualitative and - in the case of meta-analyses – quantitative synthesis of the findings across several studies and samples. Thus, they enable an easily accessible and efficient way to consider the available evidence on a specific topic (Gopalakrishnan & Ganeshkumar, 2013). The research findings were considered for each parent separately, as a key question in this thesis is to ascertain if the outcomes are the same for children of depressed fathers as they are for depressed mothers.

Summary of Reviews and Meta-Analyses Examining the Link Between Parental Depression and Child Functioning

Functioning in Children of Depressed Mothers

Many reviews and meta-analyses have studied the relationship between maternal depression and child functioning across various developmental domains. Goodman et al. (2011) for example, conducted a meta-analysis of 193 studies examining the relationship between maternal depression and child psychopathology. Children of depressed mothers had reportedly higher levels of internalising and externalising behaviour problems. In addition, maternal depression was associated with higher levels of negative affect, lower levels of positive affect and higher levels of psychopathology in their children. However, the effects were all small.

According to the findings of a number of reviews children of depressed mothers were more likely to experience depression themselves (Gelfand & Teti, 1990; Knitzer et al., 2008; Mendes, Loureiro, de Meneses Gaya, & García-Esteve, 2012) and were at an increased risk to experience other psychological disorders, such as conduct disorder (Beardslee et al., 1998). This is perhaps not surprising given that maternal depression was found to be associated with emotional dysregulation, lower self-esteem, attachment problems, antisocial behaviours, attention difficulties and peer problems in their children (Gelfand & Teti, 1990).

It was found that children of depressed mothers attain lower cognitive scores on assessment tools such as the BSID (e.g., Liu et al., 2017; Mirhosseini et al., 2015). Some researchers argued that this could be due to depressed mothers spending less time reading to, and engaging with their children (Paulsen, Keefe, & Leiferman, 2009). Children of depressed mothers also showed poorer physical health during early childhood (Raposa, Hammen, Brennan, & Najman, 2014).

Beardslee et al. (1998) argued in their review that chronicity of maternal depression is an important factor when considering the impact the disorder might have on children. It might not be surprising that the longer a child is exposed to depressive symptoms, the more significant the impact could be on the child's functioning. However, the negative effects of maternal depression can already be seen in infants who, due to their age, have only been exposed to their mothers' depressive symptoms for a short period of time. Stewart (2007) showed in his review that maternal depression was associated with poorer growth in infants. Surkan, Kennedy, Hurley, & Black (2011) further examined this relationship in their meta-analyses and reported a moderate effect between maternal depression, underweight and stunting of their infants. Aside from affecting physical functioning, maternal depression can also affect infants' emotional and behavioural functioning. For example, three to six month

old infants were found to show less affect in interactions and Puckering explained they “had already accommodated to their mothers’ depressed style, and carried this maladaptation to further social interactions.” (Puckering, 1989; p. 811). This finding supports the hypothesis that children model their parents as postulated by the social learning theory.

In summary, the findings of the results and meta-analyses suggest a strong relationship between maternal depression and less optimal child functioning within the emotional, behavioural, physical and cognitive domains of child development. However, the reviews and meta-analyses showed some important limitations. Some of the reviews (Beardslee et al., 1998; Gelfand & Teti, 1990; Knitzer et al., 2008; Puckering, 1989) were merely syntheses of findings and did not follow a systematic search protocol, nor did they provide an analysis of the quality of the studies included in their reviews. Mendes et al. (2012) conducted a systematic review; however, the authors only included studies of children aged six to 12 years, leaving it questionable if the findings can be applied to children at other ages. Liu et al. (2017) also set an age restriction (0-7 years), restricting the generalisability of the results to other populations. In addition, Liu et al. (2017), Mendes et al. (2012) and Stewart (2007) focussed on a specific child outcomes variable (child depression/cognitive functioning/infant growth); while an advantage as it offers an examination of specific effects, it also means that other outcomes (i.e., emotional functioning) that might have been considered were not explored.

Functioning in Children of Depressed Fathers

As previously suggested depression in fathers may also negatively affect their children’s functioning, such as increasing their risk to develop depression (Klein, Lewinsohn, Rohde, Seeley, & Olino, 2005) and increasing the likelihood of attempted suicide

(Lewinsohn, Olino, & Klein, 2005). Despite this, there are fewer reviews and meta-analyses exploring paternal depression than research investigations with mothers. The small number of literature reviews on paternal depression suggests that exposed children are at a higher risk to develop a psychiatric disorder (Mattejat & Remschmidt, 2008; Downey & Coyne, 1990). Those children were also more likely to experience higher levels of internalising and externalising behaviour problems, showed more social and academic difficulties, and poorer adjustment in general (Downey & Coyne, 1990). What remains unclear is whether these findings apply to fathers as well as mothers, given the authors Mattejat and Remschmidt (2008) and Downey and Coyne (1990) used the generic term 'parents'. Wanless et al. (2008) reviewed studies on paternal depression and reported that depression in fathers was related to poorer child cognitive functioning in some studies; the authors did not consider other domains of child development.

Two meta-analyses have been conducted to date that involved fathers and reviewed the relationship between depression and child emotional and behavioural functioning (Connell & Goodman, 2002; Kane & Garber, 2004). The authors of both studies defined emotional functioning (e.g., symptoms of anxiety or depression) as internalising behaviour problems/disorders, and behavioural functioning as externalising behaviour problems/disorders (e.g., oppositional defiant disorder, conduct disorder, attention deficit/hyperactivity disorder). In their meta-analysis Kane and Garber (2004) reported that parental depression was strongly related to an increase in children's internalising and externalising disorders. Connell and Goodman (2002) also revealed similar findings in their meta-analysis; they stated that paternal depression was positively related to child externalising behaviour problems, but paternal depression was not associated with higher levels of child internalising behaviour problems. Both meta-analyses focussed on studies that were published more than 15 years ago, and it is quite likely that they are no longer relevant given the

increased paternal involvement in recent years (Wang & Bianchi, 2009). It is entirely plausible that the impact of paternal depression on children has intensified due to increased time spent with their fathers, which implies an increased exposure to their fathers' emotional conditions. In addition, prevalence rates for depression have increased during the current global economic crisis (Wang et al., 2010) and over the last few decades there has been increased interest in researching paternal depression. Moreover, Connell and Goodman (2002) and Kane and Garber (2004) did also not consider the quality of the studies reviewed, thus it is difficult to ascertain the robustness of the conclusions reported. Kane and Garber (2004) also failed to specify which internalising and externalising behaviours were included as no specification was made.

To summarise, depression in both mothers and fathers is associated with less optimal child emotional, behavioural and cognitive functioning. A significant relationship between maternal depression and child physical functioning was also identified. This relationship has yet to be studied for fathers. The theories of child development outlined earlier suggested that parental depression may affect children directly through parenting behaviours. Research supports that parenting behaviours seem to be an important mechanism of risk transmission from a depressed parent to their child, for both mothers and fathers (Goodman & Gotlib, 1999; Ramchandani & Psychogiou, 2009). Researchers have also found support that parenting stress contributes to child behaviour problems and may also be an important mechanism of risk transmission from a parent to a child (Meppelder et al., 2015). Some researchers emphasised that the relationship between depression and child functioning was only significant when adding parenting behaviour as a moderator variable (Velders et al., 2011). These findings highlight the importance of including parenting as a variable when examining the relationship between parental depression and child functioning.

The Relationship Between Depression, Parenting and Child

Functioning: A Framework

Belsky (1984) developed a theoretical model of parenting (Figure 1), which provides an account of how parental, social and child factors are interrelated and together determine the quality of parenting. As previously noted, the quality of parenting refers to externally expressed parenting behaviours but also underlies internal processes, such as the experience of parenting stress (e.g., Abidin, 1992). Some researchers have explored the relationship between primarily internal (i.e., parenting stress) and external (i.e., parenting behaviours) aspects of parenting. Abidin (1992), for example, suggested that parental functioning is based on one's internal working model as a parent, which is formed through their attachment, beliefs and self-expectations around being a parent. A positive working model might support parents in their parenting role, whilst a negative model is likely to lead to the experience of parenting stress. Abidin (1990) proposed that parenting stress in turn could have a negative influence on parenting behaviour. Some empirical studies have found support for this hypothesis; Liu and Wang (2015), for example, reported that greater stress levels in mothers and fathers were associated with a higher use of dysfunctional parenting behaviours (i.e., harsh discipline, corporal punishment). Other researchers reported that parenting stress was a significant predictor of low nurturance and dysfunctional parenting practices (Rochelle & Cheng, 2016). High stress levels might lower parents' patience and tolerance when their children are acting out, making the use of negative parenting behaviours more likely. However, results on whether parenting behaviours act as a mediator between parenting stress and child outcomes are inconsistent. Some researchers have reported that parenting stress has indeed an independent effect on child functioning. Melis Yavuz et al. (2017) found direct and indirect (through parenting behaviour) effects for the relationship between maternal parenting stress and child internalising symptoms. Fathers were not included in Melis Yavuz et al.'s

(2017) study. Anthony et al. (2005) and Crnic, Gaze, and Hoffman (2005) both reported that parenting stress directly predicted child functioning; parenting behaviours did not mediate this relationship. Crnic et al. (2005) only included mothers in their study. Anthony et al. (2005) included fathers, however the authors did not present separate data for mothers and fathers, leaving it unclear if the results applied to both parents. Fathers have become much more involved in child care, making the experience of parenting stress more likely. More research is needed to examine the direct relationship between paternal parenting stress and child functioning.

Many researchers have used Belsky's (1994) parenting model as a theoretical framework when studying either parenting behaviour (van Bakel & Riksen-Walraven, 2002) or parenting stress (Cardoso et al., 2010). The model provides the theoretical framework to examine the relationship between paternal depression, parenting (behaviour and stress) and child functioning (emotional, behavioural, cognitive, physical) in this thesis. Belsky's model allows the examination of different subcomponents and interrelationships between variables, which may not only affect parenting but may also have an impact on parental depression and child functioning. For example, it was suggested earlier that parenting behaviours and parenting stress might mediate the relationship between parental depression and child functioning. The model will be described in detail in the next section.

Belsky's Model of Parenting

Belsky suggested that a number of factors contribute to the quality of parenting. These include parental factors (parents' developmental history, personality), social factors (marital relations, social network, work), and child characteristics and child development as the child's contribution.

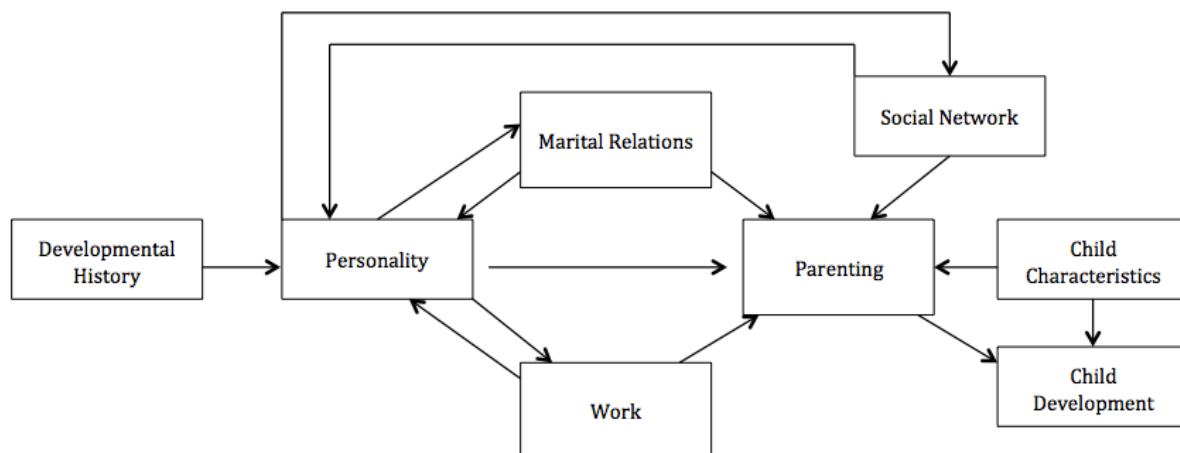


Figure 2. Belsky's model of parenting (1984)

Parental factors. Belsky (1984) proposed that parents' developmental history impacts on parenting through their personality. Developmental history is comprised of the parents' own upbringing (e.g., attachment, bonding) and their mental health (e.g., depression). Researchers have considered attachment and bonding and their impact on parenting stress. Whilst attachment and bonding bear similarities and the terms are sometimes used interchangeably, attachment describes the child's tendency to form an affectionate bond with an attachment figure. This is often their primary caregiver, and the attachment is formed to secure the child's needs of love, warmth and security (Bowlby, 1958). Bonding, on the other hand, refers to the caregivers' emotional feelings towards their child (Carter, 2005). In relation to parenting stress, Willinger, Diendorf-Radner, Willnauer, Joergl, and Hager (2005) reported that the lowest levels of parenting stress were found in parents whose bonding with their own parents was characterised by a high level of care and low level of control. Willinger et al. (2005) did not consider parental personality as a mediator variable as proposed by Belsky (1984). Researchers have, however, found some support for the relationship between attachment style and personality traits. For example, Erkoreka et al. (2016) found that

individuals, who showed high inhibition, were more likely to have an avoidant attachment style. Roisman et al. (2007) tested attachment dimensions and the relationship to the Big Five personality traits (extraversion, neuroticism, conscientiousness, openness, agreeableness) and reported that the strongest relationship was found between adult avoidant attachment and extraversion. Avoidant attachment was also associated with low levels of openness and agreeableness. Anxious attachment was strongly related to high levels of neuroticism and low levels of agreeableness. Secure attachment was only related to high levels of conscientiousness and extraversion; however, the effects were small.

Researchers have also found substantial evidence for Belsky's proposed relationship between parents' mental health and personality. Cox, McWilliams, Enns, and Clara (2004), for example, reported that low extraversion and high neuroticism were found to be associated with higher levels of depressive symptoms. Only a few researchers have tested Belsky's (1984) proposed path between parents' developmental history, personality and parenting, but confirmed that parental personality (i.e., ego-resiliency) functioned as a mediator between parental attachment and parenting behaviour (van Bakel & Riksen-Walraven, 2002).

Even though Belsky (1984) emphasised that parental mental health is a significant contributor to their quality of parenting, he did not reflect this relationship in his model of parenting. However, research studies have shown that depression in fathers and mothers, is directly associated with the use of fewer positive and more negative parenting behaviours (e.g., Lovejoy et al., 2000, Wilson & Durbin, 2011). Similar findings have been reported on the relationship between depression and parenting stress. For example, depressed mothers appeared to experience significantly more parenting stress than non-depressed mothers (e.g., Cardoso et al., 2010). Researchers have yet to review the relationship between depression and parenting stress in fathers. Considering the definition of parenting stress, the mismatch of

demands and resources could be heightened in depressed fathers and mothers, as they might feel that they do not have the resources or energy to fulfil the demands of parenting. It remains unclear if the same association exists for fathers and, if present, whether fathers experience more or less stress than mothers. Given that researchers found a direct relationship between (maternal) depression and parenting behaviour and parenting stress, it is suggested to add psychopathology as a separate variable.

Social factors. According to Belsky (1984), contextual or social factors can also affect parenting. This includes marital satisfaction and levels of social support. In line with the model, Cowan and Cowan (1992) reported that marital dissatisfaction was related to a higher ratio of negative parenting behaviours, and higher parenting stress levels (Stoneman et al., 1989). However, other researchers have not found empirical support for Belsky's proposed relationship between marital satisfaction and parenting stress (Theule et al., 2013).

Belsky also considered the role of social support, which has been reported to act as a protective factor in- between depression and dysfunctional parenting behaviours (Rodgers, 1993) and parenting stress (Deater-Deckard, 1998; Webster-Stratton, 1990). Greater levels of social support are associated with positive parenting behaviours, such as greater involvement or better communication (Lee, Anderson, Horowitz, & August, 2009). Kamalifard and others found a significant relationship between low social support and paternal depression (Kamalifard, Hasanpoor, Kheiroddin, Panahi, & Payan, 2014). Deater-Deckard (1998) reported that more social support is associated with less parenting stress in fathers and mothers (Deater-Deckard, 1998).

Another contextual factor that Belsky (1984) suggested as a determinant of parenting is work, defined as employment vs. unemployment and one's satisfaction with the job.

Research on this topic is primarily based on fathers, which may be explained by the fact that they are often the main economic provider and thus their unemployment may affect the whole family substantially. The findings on paternal employment and parenting are in line with Belsky's (1984) theoretical model: paternal unemployment has been found to be associated with an increase in dysfunctional parenting behaviours, such as being more punitive or less nurturing (McLloyd, 1989). Moreover, fathers who are unemployed seem to experience higher levels of parenting stress (Nomaguchi & Johnson, 2016). It was noted in earlier chapters that unemployment is also a significant risk factor for depression, in particular for fathers (e.g., Ballard et al., 1994). Belsky did not consider the relationship between depression and work in his model.

Further research findings suggest the possibility of additional pathways that were not accounted for in Belsky's model. For example, as outlined in chapter 2, some researchers report that depression is associated with higher levels of marital conflict and lower levels of marital satisfaction in mothers and fathers (Gabriel, Beach, & Bodemann, 2010; Johnson & Jacob, 1997). A negative association between marital satisfaction and depression is not always reported. Weinfield et al. (2009), for example, reported that paternal depression was not associated with lower levels of marital satisfaction.

Child factors. Belsky (1984) also proposed that child characteristics and child development contribute to the quality of parenting. When considering child characteristics, one factor that has received a lot of attention in research studies is child temperament. More difficult child temperament (e.g., low self-regulation) is associated with a higher use of dysfunctional parenting behaviours (Hong et al., 2015). For example, Hong et al. (2015) reported that child negative affectivity predicted negative paternal control. Previous studies have also identified a relationship between child behaviour problems and parenting stress in

mothers and fathers (e.g., Meppelder et al., 2015). This is in line with Haskett et al.'s (2006) definition of parenting stress outlined earlier, which suggests that child rearing stress is a component of parenting stress, which increases if the child is perceived as difficult.

Belsky (1984) suggested that children's development or health may also contribute to parenting aspects; support for this relationship has been found in research studies considering parenting stress. Parents of ill children reported higher levels of stress than parents of healthy children (Vermaes et al., 2008). Furthermore, Vermaes et al. (2008) reported that the more severe the physical dysfunction, the more stress parents experience. This is likely the result of the higher need of care, and- difficulties associated with having a child with a disability. Not only can a child's current illness lead to more parenting stress, but also having a child at risk of developing one can increase parents stress levels (e.g., Singer et al., 1999). An example of this are children born in the NICU; these children typically require extra care compared to healthy term infants post birth (Howe et al., 2014), and are at a high risk for persisting health issues that need ongoing treatment; as a consequence, parents of NICU infants may experience more parenting stress.

In addition to the pathways suggested in Belsky's model, researchers have found other key pathways. Galler et al. (2000) and Connell and Goodman (2002), for example, found a direct pathway between child functioning and depression, with maternal and paternal depression being associated with poorer child functioning and development. Furthermore, researchers have reported that marital dissatisfaction and marital conflicts are significantly associated with child difficulties such as adjustment problems, in particular if the child is exposed to conflicts often, or if they involve physicality (Grych & Fincham, 1990).

Hanington, Heron, Stein, and Ramchandani (2012) found that marital satisfaction functions as a mediator between parental depression and child functioning. One mechanism through which

the impact of marital dissatisfaction may be explained is modelling/social learning theory (Grych & Fincham, 1990). Couples who experience lower levels of marital satisfaction report higher levels of marital conflicts. As mentioned, children typically model their parents' behaviour (Bandura, 1977) and may imitate negative behaviours and communication expressed during parental conflicts. Grych and Fincham (1990) also argued that marital conflicts can be seen as an intense stressor that children cannot always cope with, and it may have a negative impact on the parent-child relationship. The relationship between marital satisfaction, depression, and child functioning was not considered in Belsky's model, but the research findings outlined suggest the consideration of these pathways is warranted.

To sum up, Belsky's (1984) model offers a framework for examining the pathways between parenting, parental depression and child functioning. Whilst Belsky considered a number of interrelationships in his model, research in this area suggests additional relationships: for example, a direct relationship between parental psychopathology and child functioning (e.g., Kane & Garber, 2004), parental psychopathology and parenting behaviours (Wilson & Durbin, 2011) and parenting stress (e.g., Cardoso et al., 2010), a relationship between marital satisfaction and psychopathology (e.g., Johnson & Jacob, 1997), as well as marital satisfaction and child functioning (e.g., Grych & Fincham, 1990). These research findings suggest a modification of Belsky's (1984) model. In this thesis, for the examination of the child factor of Belsky's model, the domains emotional, behavioural, cognitive and physical functioning were considered. The adapted Belsky's model is presented in Figure 2. This model provides the framework for further investigations, and is referred to as the 'adapted Belsky model' or for short, 'AB model' in this thesis. As can be seen in Figure 1, the key variables of this thesis psychopathology, parenting behaviour and parenting stress, and child functioning are highlighted in grey. These factors and interrelationships shown in the adapted model (Figure 2) will be examined across the studies in this thesis.

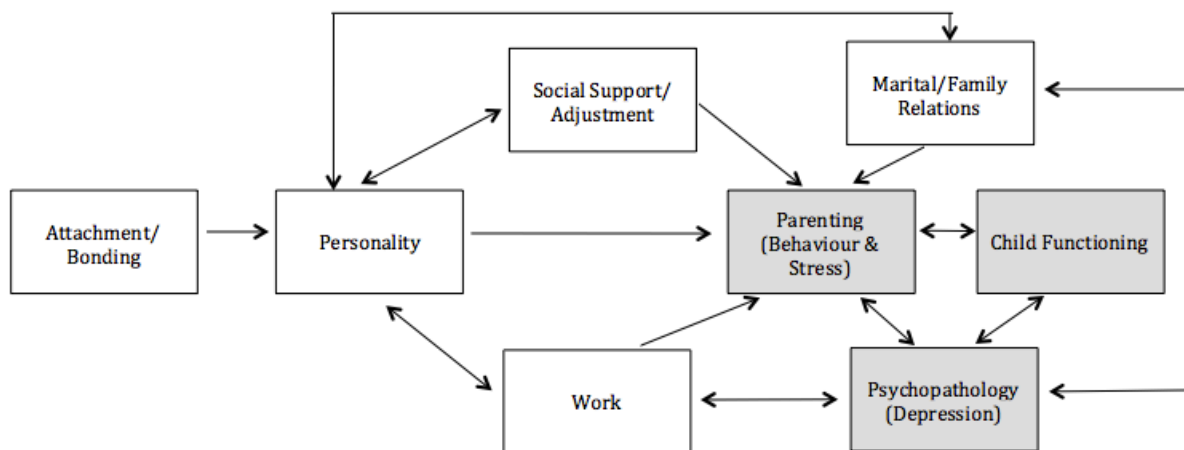


Figure 3. Adapted Belsky model – Framework for this thesis.

Conclusion

In summary, parenting is one of the most central contributors through which parents shape their child's emotional, behavioural, cognitive and physical functioning. In this chapter, different theories of child development were considered and all propose that positive parenting behaviours, such as responsiveness, affirmative reinforcements and parent-child interactions, characterised by warmth and supportiveness are likely to contribute to better child functioning. Depressed fathers and mothers are reported to show fewer positive and more negative parenting behaviours, and report experiencing higher levels of parenting stress. Previous literature reviews and meta-analyses suggest that parental depression can have a negative impact on child functioning. Of central importance to note, is that the majority of research investigations to date included only mothers, not fathers, leaving it unclear if the findings on maternal depression and child functioning also apply to fathers.

To provide a framework within which to examine the relationship between paternal depression, parenting behaviours and parenting stress, and child functioning, Belsky's model of parenting was introduced and then adapted based on research in this area to date. Various

aspects of the AB model will be examined in the following chapters. Firstly, the relationship between paternal depression and child emotional and behavioural functioning will be systematically reviewed, because this relationship was suggested in the AB model but most of the previous research has focussed primarily on mothers, and even the small number of reviews that examined paternal depression have marked limitations. For example, Mattejat and Remschmidt (2008) included fathers' experiencing a range of mental health disorders, each of which may have a different impact on children. Other reviews focussed mainly on parenting aspects, such as parenting behaviours, but did not consider the impact on child functioning (Wilson & Durbin, 2010). Furthermore, some of the reviews conducted in this area to date did not focus on specific domains of child development (Downey & Coyne, 1990), and also did not clarify whether their findings apply for both parents, or only to mothers (Downey & Coyne, 1990; Mattejat & Remschmidt, 2008). Even though Connell and Goodman's (2002) and Kane and Garber's (2004) meta-analyses took these important aspects into consideration, the quality of the studies included was not assessed and the studies included were conducted more than 15 years ago and thus might be outdated. Consequently, an up-to-date review on paternal depression and child functioning would be timely.

Secondly, the relationship between paternal depression, parenting behaviours, marital satisfaction and emotional and behavioural child functioning proposed in the AB model will be explored in a New Zealand sample of fathers. The focus will then be shifted from parenting behaviours to the emotional aspect of parenting: parenting stress in mothers and fathers, and its association with depression will be reviewed first to explore this link, as suggested in the adapted Belsky model. The relationship from parenting stress to child emotional, behavioural, cognitive and physical functioning will be examined because it was suggested in the AB model that child functioning may have an impact on parenting stress.

Additional determinants of parenting stress such as social adjustment, parental personality and work highlighted in the AB model, will be examined at a later stage in this thesis.

Chapter 4: A Systematic Review on the Relationship Between Paternal Depression and Child Emotional and Behavioural Functioning (Study 1)

As described in chapter 3, previous reviews and meta-analyses have shown several limitations and were found to be outdated. Therefore the relationship between paternal depression, and child emotional and behavioural functioning will be systematically reviewed in this chapter, including the most recent research publications, and a quality assessment of the studies.

Introduction

As shown in the previous chapter, depression in mothers and fathers can have a negative impact on children by putting their children at an increased risk of developing a psychiatric disorder themselves (Downey & Coyne, 1990; Matthey & Remschmidt, 2008). Whilst the research on maternal depression and child functioning is wide-ranging, the research examining this relationship for fathers is restricted and studies reviewing the literature on paternal depression are outdated and have additional limitations.

Purpose Of This Review

The aims of this systematic review are to review the following: the relationship between paternal depression and child functioning; to address limitations of previous reviews by specifically focussing on the relationship between paternal depression, and children's emotional and behavioural functioning; by assessing the quality of those studies, and through providing a more contemporary overview by including studies that have been conducted recently in this area.

The following research question will be explored:

Is paternal depression associated with poorer child emotional and/or behavioural functioning?

Method

This systematic review was conducted in February 2016. The methods applied were based on the Centre for Reviews and Disseminations (CRD) guidelines for carrying out reviews in health care (CRD, 2009). The CRD offers guidance on how to conduct a methodologically robust systematic review. According to the CRD guidelines, the main areas to be included in the review protocol are background, reviewing and defining research questions and inclusion criteria (selection criteria), identifying research evidence (systematic search of databases), study selection, data extraction, assessment of quality, data synthesis (results) and dissemination (discussion; CRD, 2009, p. 6ff). The background for this chapter was outlined in the previous chapters and the research question to be examined was outlined. The remaining areas (e.g., study selection) suggested by the CRD will be covered in the following sections.

Identifying Research Evidence

Search terms. Emotional and behavioural functioning cover a broad range of child functioning and are the two most commonly studied developmental domains; thus they will be considered in this review to allow the comparison of a wide range of studies. As described in chapter 3, behavioural functioning is defined as the child's overt behaviour and actions in relation to his/her external environment (Eisenberg et al., 2001). Poor behavioural functioning includes hyperactive, disruptive, antisocial or aggressive behaviour patterns. Conversely, emotional functioning refers to the child's inner psychological world (Eisenberg et al., 2001), and difficulties are often manifested in symptoms of withdrawal, inhibition, anxiety or depression. As studies used different categorisations to distinguish between emotional and behavioural problems, broad search terms were used to avoid the exclusion of potentially important contributions in the literature. The categorisation into emotional and behavioural problems was done by the researcher at a later stage. The following search terms were used to assess emotional and behavioural child problems: *Child(hood) development, (child) behaviour disorders, behaviour problems, child**.

Paternal depression was defined as symptoms of depression in males at any stage post-birth and who were fathers of children under the age of 18 years. The age limit was set for several reasons. For example, fathers tend to spend more time with their underage children than with their adult children. This means that underage children are more likely to be exposed to their fathers' emotional conditions, such as depression, and may consequently be more affected by paternal depression. Some authors have also criticised the validity of retrospective questionnaires when examining the relationship under consideration (e.g., Connell & Goodman, 2002). Setting the age limit also allows for comparisons to be made

between the studies, as adult children would differ from underage children in various dimensions, such as the degree of dependency on parental care. The search terms *depression*, *depress**, *depressive disorder**, *affective disorder**, *father** and *paternal* were applied.

Data sources. Based on the recommendations by the CRD (2009) the following five databases were searched to identify research evidence: MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, Embase, PsycINFO and CINAHL Plus. No publication date restriction was set to be able to detect differences between older and more recent studies. The search resulted in 5271 articles. Of these, 4992 were excluded based on their titles, because they were clearly not relevant to the review or they were unavailable in English. As an example, some studies examined psychiatric disorders other than depression, or assessed general aspects of fathering (e.g., involvement). 279 articles remained and their abstracts were screened (Figure 3).

Study Selection

Selection criteria were set following the recommendations by the CRD (CRD, 2009). Firstly, studies were selected by the researcher if their abstracts reported that they assessed paternal depression and the impact on children, and addressed children's functioning, particularly emotional and behavioural problems. If the abstract did not provide sufficient information on these criteria, the full text was screened by the researcher of this thesis to decide whether the article matched the inclusion criteria. Studies were excluded if they referred to fathers-to-be or looked at children with major physical or cognitive abnormalities. Children with disabilities were excluded, as these are likely to have a unique impact on children's emotional and behavioural functioning and they might affect fathers' mental health differently. The examination of this would have gone beyond the scope of this review. After

applying these criteria (selection criteria 1) and excluding duplicates or texts that could not be retrieved in full (e.g., conference publications), 51 studies remained.

Overview of selection criteria 1:

- Title or abstract showed that the relationship between paternal depression and emotional and/or behavioural child functioning was studied
- Children were ≤ 18 years of age
- Exclusion: Fathers-to-be and children with disabilities

A second set of selection criteria was then applied. Studies were included if they reported primary research findings, used psychometric tests or other standardised tools to assess paternal depression and child emotional and behavioural problems, and measured the relationship between paternal depression and child functioning. Studies that measured maternal and paternal depression simultaneously were only included if the paternal depression data was separate and could be extracted for the review. Due to the limited amount of research on fathers, fathers were the focus of this review and mothers were not included. Fathers who participated in the studies could be biological fathers or non-biological fathers (i.e., step-/foster-/adoptive) who had lived with the child for several years.

Overview of selection criteria 2:

- Primary research findings were presented
- Psychometric tests or other standardised assessment tools were used
- Paternal data was presented separately from maternal data
- Participants were biological fathers or non-biological long-term co-habiting fathers

After applying these criteria, 24 studies were excluded due to not presenting primary research findings, using non-standardised measures, not examining paternal and maternal data separately, or studying adoptive fathers without stating how long they have lived with the child. The most common reason for exclusion was “non primary research findings” with $n = 10$ studies being reviews or meta-analyses. Twenty-six studies remained for this review and their data was extracted and the quality assessed. These included two cases where multiple studies were based on the same sample (Ramchandani et al., 2005, Ramchandani, O’Connor et al., 2008, Ramchandani, Stein et al., 2008; and Cummings et al., 2005; Cummings, Cheung, & Davies, 2013; Cummings, George, Koss, & Davies, 2013); these were analysed separately as they showed methodological differences (e.g., different variables studied and different assessment times).

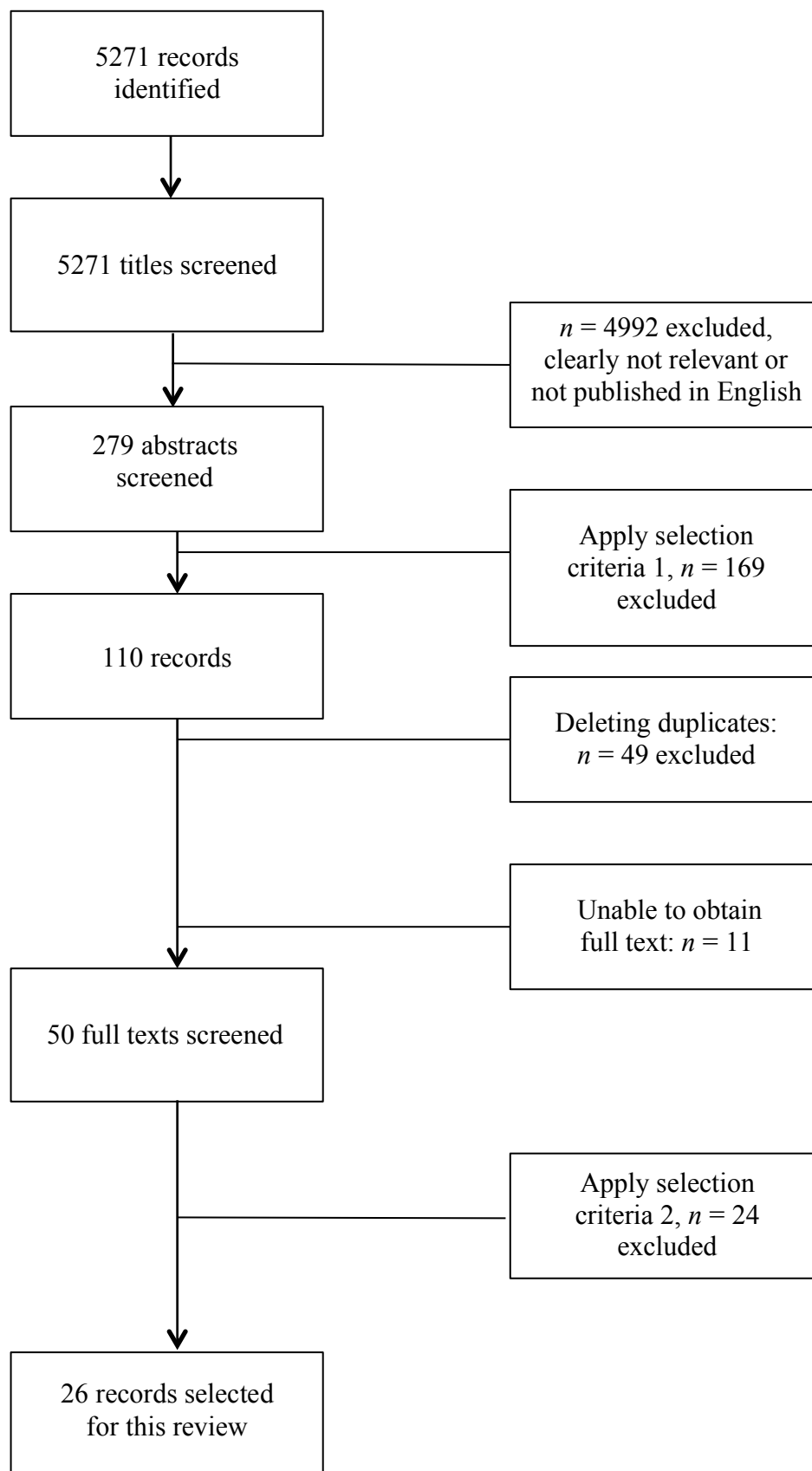


Figure 4. Study 1: Flow chart study screening

Assessment of Quality

The studies included in this review were assessed for their methodological strengths and limitations to provide an evaluation of their quality. The quality assessment was based upon the checklist for cohort studies (Scottish Intercollegiate Guidelines Network (SIGN), 2011). The SIGN provides evidence-based clinical practice guidelines and methodological checklists for different study designs. The SIGN-50 checklist for cohort studies is reportedly the most appropriate tool for the assessment of observational studies (Bai, Shukla, Bak, & Wells, 2012). The quality of the studies was assessed using 10 criteria. Each quality criterion, for example “The study addressed an appropriate and clearly focused question”, was classified in terms of one of the following four outcome ratings: ‘well covered’ (2 points); ‘adequately addressed’ (1 point); and ‘poorly covered’ or ‘not addressed’ (0 points), as specified by SIGN (2011) for assessing the methodological quality of studies.

The studies included in this review were cohort studies and cross-sectional studies. In order to use one checklist for both designs, the SIGN checklist for cohort studies was slightly adapted (i.e., outcome could be measured at one point only). The points given were specified for the purpose of this study (see below) and each criterion was labelled instead of numbered to enable the reader to use the quality rating without having to refer to the original checklist. Each study was assessed by the main researcher (coder 1) and two additional independent coders (2 & 3), both PhD graduates with experience in quality ratings. The independent coders shared the coding of the studies using the ten quality criteria outlined below.

The assessment categories were as follows:

(I) Research question: The study addressed an appropriate and clearly focused question. This means the purpose of the study was outlined and hypotheses specified.

(II) Sample: The sample was representative of the general population. If two groups were studied these were comparable in all respects other than the factor under investigation.

(III) Control group: A control group was present that was clearly distinct from the depression group.

(IV) Allocation: Inclusion and exclusion criteria were reported and were well defined. Points were given based on the clarity of the inclusion and exclusion process applied by the researchers.

(V) Attrition: The total number of people asked to take part, the number who participated in each of the groups being studied and how many dropped out were reported. The dropout rate was indicative of the points given, i.e., studies with only 10 dropout or less (90% attrition) received 2 points (well-covered).

(VI) Assessment: The assessment tools used for depression status and child functioning were valid and reliable. To achieve the score “well-covered” standardised tests, whose effectiveness is well-known or was demonstrated, had to be used. One point was given if the study used their own assessment tool but demonstrated its reliability.

(VII) Blinding: The assessment of child outcome was conducted without knowledge of father’s depression status.

(VIII) Bias: The study minimised the risk of bias or confounding factors. To achieve full points, the main potential confounders had to be identified and were taken into account in the design and analysis.

(IX) Power: Sufficient power was achieved based on the number of fathers included ($N > 1000$ = well covered, $N > 100$ = adequately addressed and $N < 100$ = poorly covered)

(X) Generalisability: The power and sample allow the results of the study to be applied to the general population.

The degree of inter-rater reliability between the three coder's scores was calculated using Cohen's kappa. The Kappa measure of agreement between coder 1 and 2 was .90 ($p < .001$), indicating an 'almost perfect' level of inter-rater reliability and .81 ($p < .001$) between coder 1 and 3, which can be categorised as a 'strong' agreement (Cohen, 1960; McHugh, 2012). Disagreements in scores were discussed afterwards and were resolved by adjusting some of the ratings after consensus was reached.

Results

Study Characteristics

Design. All 26 studies included in this review were observational studies (cohort or cross-sectional studies). The studies were published between 1988 and 2015, with most of the studies ($n = 20$) being published in the last 10 years. As aforementioned, no date restriction was set to allow for differences to be identified between older and newer studies.

Assessment of depression. Only four studies conducted a clinical assessment to diagnose MDD, whilst most of the studies ($n = 22$) assessed depressive symptoms, which could include participants with MDD but are also likely to have included participants who experienced a range of symptoms but did not experience clinical levels of depression. One study (Ringoot et al., 2015) tested a subsample using the CIDI to assess the accuracy of their depression screening tools (Brief Symptom Inventory and depression self-reports created by the researchers) and reported a sensitivity of 70% and specificity of 80% for MDD in fathers. Four studies used the Edinburgh Postnatal Depression Scale (EPDS) as a screening tool for depressive symptoms but emphasised that the EPDS has an 81% accuracy of detecting MDD

in participants and is therefore likely to assess MDD accurately. Nevertheless, the EPDS can only be seen as a screening tool and does not provide a clinical diagnosis.

Assessment of child functioning. Twenty-one of the reviewed studies included measures of both emotional and behavioural problems in children (see Table 1). Two studies considered behavioural problems exclusively (Callender et al., 2012; Hautman et al., 2015) and three included emotional problems only (Gross et al., 2008; Reeb & Conger, 2009; Van Roekel et al., 2011). Most of the studies defined behavioural problems with aggression-based constructs (including delinquency, conduct disorder, opponent defiant disorder). Emotional problems were described slightly differently by each of the studies in this review, such as anxious/depressive/withdrawn (Weinfield, Ingerski, & Moreau, 2009) or emotional functioning/psychopathology (Ramchandani, Stein et al., 2008). Fourteen studies divided emotional and behavioural functioning into “internalising” and “externalising problems”; the remaining studies assessed more specific groups of problems (e.g., depressive symptoms, oppositional behaviour).

Table 1

Study 1: Characteristics of the Studies Reviewed.

	Country	Study Design	Sample		Control Group	Assessment		Child Functioning	
			Fathers <i>n</i>	Mothers <i>n</i>	Child age (years)	Yes/No	Paternal depression	<i>Child functioning</i>	<i>E B</i>
Brennan et al. (2002)	Australia	Cross-sectional	522	522	15	✓	SCID	Schedule for Affective Disorders and Schizophrenia for School-Age children-Revised (K-SADS-E)	✓ ✓
Callender et al. (2012)	USA	Cohort	245	245	3, 5 ½	✗	Brief Symptom Inventory (BSI)	Child Behaviour Checklist (CBCL), Teacher Report Form	✗ ✓
Cummings et al. (2005)	USA	Cross-sectional	235	235	<5	✗	CESD	CBCL, Child Behaviour Scale (CBS)	✓
Cummings, Cheung et al. (2013)	USA	Cohort	206	206	6, 7, 8	✗	CESD	CBCL	✓ ✗

Country	Study Design	Sample		Child age (years)	Control Group	Assessment	Child Functioning	
		Fathers n	Mothers n		Yes/No	Paternal depression	E	B
Cummings, George et al. (2013)	Cohort	321	321	6, 7, 13	✗	CESD	✓	✓
Davé et al. (2008)	Cross-sectional	248	250	4 - 6	✓	PHQ	✓	✓
Elgar et al. (2007)	Cohort	330	3854	10 - 15	✗	CESD-12	✓	✓
Gross et al. (2008)	Cohort	297	297	2, 4	✗	CESD		
Hanington et al. (2012)	Cohort	11198	11954	3 ½	✗	EPDS	✓	✓
Hautman et al. (2015)	Cross-sectional study	106	106	5	✗	Depression Anxiety Stress Scale (DASS)	✗	✓

Country	Study Design	Sample		Control Group		Paternal depression	Assessment	Child Functioning	
		Fathers <i>n</i>	Mothers <i>n</i>	Child age (years)	Yes/No			<i>E</i>	<i>B</i>
Herbert et al. (2013)	Cohort study	128	NA	4 - 7	✗	CESD	Child functioning (DCL-ODD)	✓	✓
Marchand-Reilly (2012)	Cross-sectional	36	36	4 - 8	✗	CESD	Behaviour Assessment System for Children-Parent Report (BASC-PRS)	✓	✓
Marchand & Hock (1998)	Cross-sectional	46	46	4	✗	CESD	CBCL	✓	✓
Marchand et al. (2004)	Cross-sectional	64	64	6 - 8	✗	CESD	CBCL	✓	✓
Meadows et al. (2007)	Cross-sectional	2120	2120	3	✗	CIDI Short-Form	CBCL	✓	✓
Middleton et al. (2009)	Cross-sectional	37	74	2 - 8	✗	BDI-II	CBCL	✓	✓

Country	Study Design	Sample		Control Group	Assessment	Child Functioning				
		Fathers <i>n</i>	Mothers <i>n</i>	Child age (years)	Yes/No	Paternal depression	<i>E</i>	<i>B</i>		
Ramchandani et al. (2005)	UK	Cohort	8431	11833	3 - 5	✗	EPDS	Rutter Revised	✓	✓
Ramchandani, O'Connor et al. (2008)	UK	Cohort	4792	10975	6 - 7	✗	EPDS	Preschool Scales, SDQ SDQ, Development and Well-Being Assessment (DAWBA)	✓	✓
Ramchandani, Stein et al. (2008)	UK	Cohort	7601	12884	3 ½, 7	✓	EPDS	Rutter Revised Preschool Scales, DAWBA	✓	✓
Reeb & Conger (2009)	USA	Cohort	451	451	13, 14	✗	Symptom Checklist-90-Revised (SCL-90-R) Depression Subscale	SCL-90-R Depression Subscale	✓	✗
Ringoot et al. (2015)	Netherlands	Cohort	4545	4545	3, 6	✗	Self-reported lifetime depression, BSI	CBCL, Berkeley Puppet Interview (BPI)	✓	✓

Country	Study Design	Sample		Control Group	Assessment		Child Functioning
		Fathers <i>n</i>	Mothers <i>n</i>	Child age (years)	Yes/No	Paternal depression	<i>E</i> <i>B</i>
van Roekel et al. (2011)	Netherlands Cohort	428	428	13, 14, 15, 16, 17	✗	Kandel & Davies Depressive Mood Scale	Kandel & Davies Depressive Mood Scale ✓ ✗
Velders et al. (2011).	Netherlands Cohort	2698	2698	3	✗	BSI	CBCL ✓ ✓
Weinfeld et al. (2009)	USA Cross-sectional	49	51	2 ½	✗	CESD	CBCL ✓ ✓
Weitzmann et al. (2011)	USA Cross-sectional	21993	21993	5 - 17	✗	PHQ-II	Columbia Impairment Scale (CIS) ✓ ✓
Welner & Rice (1988)	USA Cross-sectional	73	76	12	✓	Schedule for Affective Disorders and Schizophrenia (SADS)	Diagnostic Interview for Children and Adolescents (DICA), Child Depression Inventory (CDI) or BDI, CBCL ✓ ✓

Note: E = assessed emotional problems, B = assessed behavioural problems; M = mean value; NA = not available; ✓ = yes, ✗ = no.

Sample characteristics. There was a wide range of sample sizes in the studies from $N = 36$ (Marchand-Reilly, 2012) to $N = 21993$ families (Weitzman et al., 2011). Eighteen studies assessed the same number of fathers and mothers, whereas the number varied greatly in the remaining studies. Two studies (Herbert et al., 2013; Marchand-Reilly, 2012) measured depression only in fathers, not mothers. 21 studies indicated including only biological fathers; however, it should be noted that some of these studies did not clearly describe the fathers as biological fathers but used terms such as “children and their parents” (e.g., Callender et al., 2012). Five studies clearly mentioned involving step- and/or adoptive fathers (Brennan et al., 2002; Cummings et al., 2005; Davé et al., 2008; Marchand et al., 2004; Weitzman et al., 2011). Child age ranged from 2-17 years.

All of the studies considered additional factors besides paternal depression and child functioning. Table 2 presents the additional variables (other than demographics) that were included by the studies under review to present an overview of co-variables assessed. Most frequently assessed were parenting, marital functioning, comorbid symptoms (e.g., alcohol abuse) and child functioning.

Table 2

Study 1: Additional Variables Assessed by the Studies Under Review

Study	Additional Assessments
Brennan et al. (2002)	<ul style="list-style-type: none"> - paternal substance abuse - timing of paternal diagnosis - chronic family stress - father's expressed emotion - marital conflict
Callender et al. (2012)	<ul style="list-style-type: none"> - negative perceptions of child behaviour - use of physical punishment
Cummings et al. (2005)	<ul style="list-style-type: none"> - parenting - marital functioning
Cummings, Cheung et al. (2013)	<ul style="list-style-type: none"> - children's emotional insecurity
Cummings, George et al. (2013)	<ul style="list-style-type: none"> - parental negative responsiveness to child distress - children's attachment representations - representations of warmth of parent-child relationships
Davé et al. (2008)	<ul style="list-style-type: none"> - father engagement with the child - father responsibility for the child - parental stress - bonding with the child - perceptions of the child - father-child contact time - attitudes towards fathering

	- couple relationship
	- recent life events
Elgar et al. (2007)	- parental behaviour
Gross et al. (2008)	- child noncompliance
Hanington et al. (2012)	- marital conflict
Hautman et al. (2015)	- parenting
	- paternal anxiety
Herbert et al. (2013)	- father involvement
	- parenting practices
	- paternal ADHD symptoms
	- child social skills
	- child cognitive ability
	- child academic achievement
Marchand-Reilly (2012)	- parent discipline
Marchand & Hock (1998)	- maternal restriction and punishment
	- child attachment security
Marchand et al. (2004)	- adult attachment orientations
	- marital conflict
Meadows et al. (2007)	- parental anxiety
	- relationship status
Middleton et al. (2009)	- parent-child relationship inventory
Ramchandani, O'Connor et al. (2008)	- past history of severe depression
Ramchandani, Stein et al. (2008)	- parental anxiety
	- (family) history of depression
Reeb & Conger (2009)	- relationship closeness

Ringoot et al. (2015)	- smoking and alcohol during pregnancy
	- child verbal abilities
van Roekel et al. (2011)	- perceived parental support
	- 5-HTTLPR genotyping
Velders et al. (2011).	- prenatal family functioning
	- smoking and alcohol use during pregnancy
	- infant weight at birth
Weinfield et al. (2009)	- marital quality
Weitzmann et al. (2011)	- child and family characteristics
	- parental physical health
Welner & Rice (1988)	- history of depression
	- personal resources
	- family history
	- parental and child intelligence
	- parental personality
	- child achievement
	- child reading skills
	- child self-concept

Quality of Included Studies

Table 3 provides ratings for each of the studies on 10 quality criteria. The rating scale is offered as a guide to the relative methodological strengths of the studies, but due to the variety of designs, methods and outcome measures used by the studies it does not provide an exact comparative measure across the studies. For the purpose of this review the quality of the studies yielding 0 - 5 points in total was described as ‘poor’, 6 – 10 as ‘low’, 11 – 15

‘acceptable’ and 16-20 ‘high’. Based on this rating system, none of the studies were classified as being of poor quality; six studies can be listed as low quality, 19 as of acceptable quality and one as of high quality. Hence, most of the studies were of acceptable quality.

The quality results based on each of the 10 criteria for the studies in this review are summarised here. This is followed by a summary of the study findings in regards to paternal depression and child functioning.

Research question. All but one study (Cummings et al., 2005) outlined the purpose of the study and specified hypotheses. For example, Weinfield et al. (2009) stated the research question was: “Do maternal and paternal depressive symptoms each predict internalizing and externalizing behavior directly?” (p. 41). Other studies, for example, Cummings et al. (2005), mentioned the purpose of the study, but failed to specify hypotheses or clear research questions and as a consequence did not receive full points.

Sample. The studies included in this review were based on samples from different populations, the majority of which could be considered as representative of the general population ($n = 19$). The remaining studies did not cover the criterion well due to including participants from specific client groups, such as children with identified behaviour problems (Hautman et al., 2015) or psychiatric clients (Welner & Rice, 1988), which may not be representative of the general population.

Control group. In contrast to quality criterion I and II, very few studies included a control group (Brennan et al., 2002; Davé et al., 2008; Gross et al., 2008; Ramchandani, Stein et al., 2008; Welner & Rice, 1988). Despite including a control group, two of these studies (Brennan et al., 2002; Gross et al., 2008) did not study the differences between the depression

and control group in further analyses and therefore no comparisons could be made. Without a control group it was unclear if the findings could be attributed to fathers' depression status or whether another underlying factor led to the results reported.

Allocation. The majority of the studies ($n = 19$) outlined their inclusion and exclusion criteria adequately. The remaining seven studies did not specify who was eligible to participate in the study (Marchand & Hock, 1998; Meadows et al., 2007; Middleton et al., 2009; Ramchandani, O'Connor et al., 2008; Ramchandani, Stein et al., 2008; Reeb & Conger, 2009; Weinfield et al., 2009). A broad recruitment strategy might be of advantage for recruiting large sample sizes due to no one being excluded; however, it made it difficult to conclude that the findings were attributable to the variables under investigation due to a large amount of possible confounders.

Attrition. All studies mentioned how many participants were included. Only four studies had a low ($< 10\%$) drop out of participants (Cummings et al., 2005; Cummings, Cheung, et al., 2013; Gross et al., 2008; Reeb & Conger, 2009), 16 reported a moderate dropout rate (10-50%), two studies had a high dropout rate, with more than half of the participants dropping out of the study (Davé et al., 2008; Ramchandani, Stein et al., 2008) and four studies did not reveal their attrition rate (Callender et al., 2012; Hautman et al., 2015; Marchand & Hock, 1998; Weinfield et al., 2009). It can be questioned whether the results of the two studies with the large dropout rates would have been substantially different if the dropout participants were included in the data analysis. However, it should be noted that some studies conducted assessments over several years and the attrition rate might have been high at the start but decreased over time (e.g., Ramchandani, Stein et al., 2008). It is also not clear why the four studies listed above did not mention their dropout rate.

Assessment. A common methodological strength across the studies was that they all used validated and reliable assessment tools to measure depression and child problems. The studies used a range of depression tools with the most common being the CESD, which was used in 10 of the studies. Only four studies (Brennan et al., 2002; Meadows et al., 2007; Ringoot et al., 2015; Welner & Rice, 1988) used structured interviews to assess fathers' depression status. Interviews can be seen as advantageous because self-reports of depressed parents could be biased by their illness and therefore lead to different outcome scores when reporting their child's behavioural difficulties compared to non-depressed parents (Najman et al., 2001). In addition, interviews can be seen as a valid tool to provide a clinical diagnosis of depression. Child emotional and behavioural problems were also assessed using a variety of questionnaires; the most frequently used tool was the CBCL. Two studies (Brennan et al., 2002; Welner & Rice, 1988) used structured interviews to assess child functioning. Hautman et al. (2012) used observation and an interview held by a clinician for one part of their assessment.

Blinding. Coders were blind to fathers' depression status in two of the studies when conducting all child assessments (Brennan et al., 2002; Welner & Rice, 1988). Two studies considered blinding partly by blinding at least one assessment (Herbert et al., 2013, Marchand & Hock, 1998), leaving 22 studies in which blinding was not considered. It remains possible that fathers' depression status might have affected the coders child ratings, as the knowledge of a father being depressed or non-depressed could have led to the assumption that the child could exhibit more/fewer difficulties. However, most of the studies used self-reports, which might explain why no blinding was reported, as it was not feasible.

Detection bias. When reviewing the studies on how they attempted to minimise the risk of detection bias or confounding factors, it was revealed that all but two studies managed

to minimise the risk of detection bias. This is an important methodological strength of the studies as confounders such as co-existing maternal depression could have affected the results substantially. Only Marchand-Reilly (2012) and Marchand and Hock (1998) did not take the risk of bias and confounding variables into account.

Power. Power for the relationship between paternal depression and child functioning was not statistically measured in this review but assessed based on the number of fathers included in the study. Eight studies included more than 1000 fathers, the largest number of studies included 100-500 fathers ($N = 12$), and six studies included fewer than 100 fathers in their sample (Marchand-Reilly, 2012; Marchand & Hock, 1998; Marchand et al., 2004; Middleton et al., 2009; Weinfield et al., 2008; Welner & Rice, 1988). Small sample sizes make it questionable whether the findings can be applied to other people outside of the sample group, as the effects could be specific to the small group of individuals studied. For example, Marchand-Reilly (2012) only included 36 fathers in their study and consequently their results can only be seen as explorative.

Generalisability. The sample size and sample characteristics were considered when rating the generalisability of the studies included in this review. The majority of the studies included participants from the general population; however, not all of these studies included large sample sizes. Generalisations should be made with caution for 12 studies, and no generalisations of the findings should be made for five studies due to their sample size and sample characteristics not meeting the required criteria.

Comparing the methodologically strongest study and weakest studies. Marchand and Hock (1998) was the methodologically weakest study with the lowest quality rating of seven points having scored zero on many criteria. Middleton et al (2009), Hautman et al.

(2015) and Weinfield et al. (2009) also received very few points on the quality rating (8 points each). Common factors among those three studies were a low number of fathers included, unclear attrition rates, the absence of a control group and ill-defined inclusion and exclusion criteria. Marchand and Hock's (1998) study for example should be seen as explorative only as the sample size was low ($n = 49$) and no attrition rate was mentioned. Consequently, it remains unclear how many fathers dropped out and whether these differed from the participants included in the study. It is also possible though, that the absence of a note about the dropout rate meant that everyone participated and therefore no dropout rate was mentioned. As aforementioned, the absence of a control group can be seen as a limitation because the results cannot clearly be attributed to the main variable under consideration: paternal depression. Another limitation was that the studies did not clearly describe their inclusion and exclusion criteria, leaving it unclear how the sample was selected and whether the study can be compared to others.

The methodologically strongest study in the review based on the total scores across the quality criteria was Brennan et al.'s study (2002) achieving the highest quality score (16 points). Brennan et al.'s study (2002) was the only one that achieved a high quality rating based on the classification used in this review. Brennan et al.'s (2002) used interviews as assessment tools for paternal depression and child functioning, which allowed for the blinding of raters and reduced reporter bias. It was one of a few studies that included a control group. In addition, Brennan et al.'s (2002) sample size ($n = 522$ fathers) was large, allowing the possibility to make generalisations. The research questions were well-defined and the inclusion and exclusion process were made transparent.

Summary of the quality rating. Most of the studies showed acceptable quality, six could be described as of low quality and one achieved a high quality rating. The majority of

the studies included samples that can be considered as representative of the general population. Almost all studies attempted to minimize the risk of potential confounders, strengthening the assumption that the results reported could be attributed to the variables under consideration. In addition, most of the studies reported a low to moderate dropout rate. However, only half of the studies included in this review included large sample sizes; nine included large numbers of fathers. Consequently, the generalisability of the results of some of the studies can be questioned, as their results might not be applicable to other participant groups and therefore can only be seen as exploratory. The results reported by the studies will be reviewed in the following section with consideration to the quality of the studies reporting the results.

Table 3

Study 1: *Quality Assessment of the Studies based on the Adapted SIGN Checklist for Cohort Studies*

	Research Question (I)	Sample (II)	Control Group (III)	Allocation (IV)	Attrition (V)	Assessment (VI)	Blinding (VII)	Bias (VIII)	Power (IX)	General- sability (X)	Total Score (x/20)
<i>Brennan et al.</i> <i>(2002)</i>	2	2	1	2	1	2	2	2	1	1	16
<i>Callender et al.</i> <i>(2012)</i>	2	1	0	2	0	2	0	2	1	0	10
<i>Cummings et al.</i> <i>(2005)</i>	1	2	0	2	2	2	0	2	1	1	13
<i>Cummings, Cheung</i> <i>et al. (2013)</i>	2	2	0	2	2	2	0	2	1	1	14
<i>Cummings, George</i> <i>et al. (2013)</i>	2	2	0	2	1	2	0	2	1	1	13
<i>Davé et al. (2008)</i>	2	2	2	2	0	2	0	2	1	1	14

Research Question (I)	Sample (II)	Control Group (III)	Allocation (IV)	Attrition (V)	Assessment (VI)	Blinding (VII)	Bias (VIII)	Power (IX)	Generalisability (X)	Total Score (x/20)
<i>Elgar et al. (2007)</i>	2	2	0	2	1	2	2	1	1	13
<i>Gross et al. (2008)</i>	2	1	1	2	2	2	2	1	0	13
<i>Hanington et al. (2012)</i>	2	2	0	1	2	0	2	2	2	14
<i>Hautman et al. (2015)</i>	2	0	0	1	0	2	2	1	0	8
<i>Herbert et al. (2013)</i>	2	1	0	2	1	2	1	2	1	12
<i>Marchand-Reilly (2012)</i>	2	2	0	2	1	2	0	0	0	9
<i>Marchand et al. (2004)</i>	2	2	0	2	1	2	2	0	0	11
<i>Marchand & Hock (1998)</i>	2	2	0	0	0	2	1	0	0	7

Research Question (I)	Sample (II)	Control Group (III)	Allocation (IV)	Attrition (V)	Assessment (VI)	Blinding (VII)	Bias (VIII)	Power (IX)	Generalisability (X)	Total Score (x/20)
<i>Meadows et al. (2007)</i>	2	1	0	0	1	2	2	0	2	11
<i>Middleton et al. (2009)</i>	2	1	0	0	1	2	2	0	0	8
<i>Ramchandani et al. (2005)</i>	2	2	0	1	1	2	2	2	2	14
<i>Ramchandani, O'Connor et al. (2008)</i>	2	2	0	0	0	2	2	2	2	12
<i>Ramchandani, Stein et al. (2008)</i>	2	2	2	0	1	2	2	2	2	15
<i>Reeb & Conger (2009)</i>	2	2	0	0	2	2	2	1	1	12

Research Question (I)	Sample (II)	Control Group (III)	Allocation (IV)	Attrition (V)	Assessment (VI)	Blinding (VII)	Bias (VIII)	Power (IX)	Generalizability (X)	Total Score (x/20)
Ringoot et al. (2015)	2	2	0	1	2	2	0	2	2	14
van Roekel et al. (2011)	2	2	0	2	1	2	0	2	1	13
Velders et al. (2011).	2	2	0	0	2	2	0	2	2	13
Weinfield et al. (2009)	2	2	0	0	2	2	0	0	0	8
Weitzmann et al. (2011)	2	2	0	2	1	2	0	2	2	15
Welner & Rice (1988)	2	1	2	1	2	2	2	0	0	13

Note: Studies achieved points for each criterion: 2 points = “well covered” (W.C.), 1 point = “adequately addressed” (A.A.), 0 points = “poorly covered” (P.C.) / “not addressed” (NA).

- (I) The study addressed an appropriate and clearly focused question
- (II) The sample was representative for the general population.
- (III) A control group was present that was clearly distinct from the depression group.
- (IV) Inclusion/exclusion criteria were reported and were well defined.
- (V) The study indicated the total number of people asked to take part, the number who participated in each of the groups being studied and the number that dropped out.
- (VI) The assessment tools used for depression status and child outcome were reliable.

The Relationship Between Paternal Depression and Child Functioning

The data analysis presented in this review is narrative allowing for a more detailed examination of the relationship between paternal depression and child functioning. Outcomes are presented for each study in Table 4.

General results. Twelve (out of 20) studies reported that paternal depression is significantly related to both child emotional and behavioural functioning. Twenty out of the 22 studies that considered behavioural problems reported that there was a strong positive relationship between paternal depression and children's behavioural problems; 17 of the 24 studies on emotional problems found significant results. Overall, all but one study (Meadows et al., 2007) found at least one significant effect for the relationship between paternal depression and child functioning.

Meadows et al.'s (2007) reported that the relationship between depression and child functioning was not significant for fathers. Taking the quality of the study into consideration did not account for the non-significant results. For example, Meadows et al. (2007) included a large number of fathers and used a well-validated clinical interview for the assessment of paternal depression.

Some studies reported that the impact of paternal depression was only significant for one domain: either for child behavioural or for emotional functioning. Marchand and Hock (1998) did not find any significant results for behavioural functioning. However, it should be noted that Marchand and Hock's study received the lowest quality rating of the studies. It can be questioned whether their results are replicable and are likely not to be applied to the wider population as they are based on only 49 fathers.

Six studies did not find any significant associations between paternal depression and emotional child functioning. This includes Brennan et al.'s (2002) study, which had been shown to be of high methodological quality. Investigating this result further, it was revealed that none of the studies, which assessed clinical levels of depression (Brennan et al., 2002; Davé et al., 2008; Meadows et al., 2007; Welner & Rice, 1988) found any significant effects for emotional functioning. However, all but one of these studies (Meadows et al., 2007) did report that paternal depression is associated with higher levels of behavioural problems in children.

Results of low compared to high quality studies. The four studies, which achieved the lowest methodological quality ratings (Hautman et al., 2015; Marchand Reilly, 2012; Marchand & Hock, 1998; Middleton et al., 2009) showed inconsistent findings. Three of the studies reported a significant relationship between paternal depression and child behaviour problems. Marchand and Hock's (1998) findings stand in contrast to this: paternal depression was not related to higher rates of behaviour problems in their children. Hautman et al. (2015) did not investigate emotional problems; two of the remaining three studies showed that paternal depression was associated with more emotional problems in their children. Middleton et al. (2009) could not replicate this finding. These studies all focused on particularly young children (age 2 - 8), and consequently it was questioned whether the young age of the child participants could have affected the results. However, no age effect could be revealed with significant findings across all age bands.

The five studies with the highest quality rankings (Brennan et al., 2002; Elgar et al., 2007; Ramchandani, Stein et al., 2008; Weitzmann et al., 2011; Welner & Rice, 1988) were in agreement that paternal depression was significantly associated with higher rates of

behavioural problems in their children. However, when examining the effects on emotional functioning, the results reported were inconsistent, with only two studies (Elgar et al., 2007; Weitzmann et al., 2011) showing significant results for depression and emotional problems.

Results of studies comparing depressed with non-depressed fathers. Four studies (Brennan et al., 2002; Davé et al., 2008; Ramchandani, O'Connor et al., 2008; Ramchandani, Stein et al., 2008) compared depressed fathers with non-depressed fathers to study their differences. All of these studies found that children of depressed fathers seem to display significantly more behavioural problems than children of non-depressed fathers. Only Ramchandani, O'Connor et al. (2008) found that children of depressed fathers also appear to experience more emotional problems. The remaining three studies did not find a significant association between paternal depression and emotional child problems. All four studies showed an acceptable-to-high quality, emphasising the strength of this finding.

Results of studies considering the possibility of an informant bias. In regards to the possibility of an informant bias, previous studies have suggested that depressed mothers tend to rate their children as more difficult than healthy mothers (Najman et al., 2001). Using multiple raters could decrease the risk of biased ratings. Notably Callender et al. (2012), Marchand-Reilly (2012) and Ringoot et al (2015) used different informant reports to estimate whether these lead to different results. When examining the relationship between paternal depression and child behaviour problems, it does not seem to matter whether the mother or father is the informant (based on self-reports). All studies found significant effects regardless of the informant. The results were different for emotional problems: whereas Ringoot et al. (2015) found significant results for the father, mother (self-reports), and child report (interview), Marchand-Reilly (2012) reported that the results were only significant if the father rated the child's behaviour. Regarding the substantially higher quality of Ringoot et

al.'s (2015) study, the findings of this study might be seen as more reliable but do not offer support for the hypothesis that an informant bias exists. However, no conclusions should be drawn based on a single study. Emotional problems were not part of the assessment in Callender et al.' study (2012). Brennan et al. (2002), and Welner and Rice (1988) used independent assessments of child functioning via clinical interviews. Both studies identified a significant relationship between paternal depression and child behavioural functioning and reported the absence of a relationship between paternal depression and child emotional functioning.

Publication date effect. Lastly, no publication date effect could be detected as both studies that were published within the last 10 years and studies that were older than 10 years found significant effects. No difference in their methodological quality could be found between the older vs. newer studies either.

Summary of the key results. Summing up, the majority of studies reported a significant relationship between paternal depression and child emotional and behavioural problems. However, the low methodological quality of some studies (e.g., poor allocation and small sample sizes) challenges the validity and generalisability of their findings. Moreover, the results were inconsistent for the relationship between paternal depression and emotional problems.

Table 4

Study 1: Summary of the Reported Results on the Relationship Between Paternal Depression and Child Functioning

	Emotional problems		Behavioural problems		Note
	Construct	Result	Construct	Result	
Brennan et al. (2002)	- depressive	n.s.	- externalising symptoms	$p < .01$	Results significant for whole sample;
	symptoms				however, not significant when comparing
	- non-depressive	n.s.			depressed sample to control group
	internalising symptoms				
Callender et al. (2012)	-	-	- externalising behaviour	$T1: p < .01$	$T1 =$ Assessment at age 3
					$T2 =$ Assessment at age 5 ½
				$T2:$	$FR =$ Father report
				$FR:$	$MR =$ Mother report
				$p < .001$	$TR =$ Teacher report
				$MR:$	
				$p < .05$	

Emotional problems			Behavioural problems		Note
	Construct	Result	Construct	Result	
TR: n.s.					
Cummings et al. (2005)	- internalising problems	$p < .001$	- externalising problems	$p < .001$	
Cummings, Cheung et al. (2013)	- anxiety/ depression - withdrawal - somatic symptoms	$p < .05$ $p < .001$ $p < .001$	-	-	Results apply for both assessment times
Cummings, George et al. (2013)	-internalising problems	$p < .01$	- conduct disorder (CD) - externalising problems	$p < .05$ $p < .01$	
Davé et al. (2008)	- emotional symptoms	n.s.	- CD	$p < .01$	Results compared to control group
Elgar et al. (2007)	- internalising problems	$p < .01$	- externalising problems	$p < .01$	Results apply to both assessment times
Gross et al. (2008)	- internalising problems	$p < .01$	- externalising problems	-	Results not presented for externalising problems

	Emotional problems		Behavioural problems		Note
	Construct	Result	Construct	Result	
Hanington et al. (2012)	- emotional problems	$p < .001$	- CD	$p < .001$	Results apply to both assessment times
Hautman et al. (2015)	-	-	- externalising symptoms - oppositional defiant disorder (ODD)	$p < .01$ $p < .01$	ODD assessed by clinician
Herbert et al. (2013)	- internalising problems	$p < .01$	- externalising problems	$p < .01$	
Marchand-Reilly (2012)	- internalising problems	FR: $p < .01$ MR: n.s.	- externalising problems	FR, MR: $p < .01$	FR = Father report MR = Mother report
Marchand et al. (2004)	- internalising problems	$p < .01$	- externalising problems	$p < .05$	
Marchand & Hock (1998)	- internalising problems	$p < .05$	- externalising problems	n.s.	

	Emotional problems		Behavioural problems		Note
	Construct	Result	Construct	Result	
Meadows et al. (2007)	- anxiety	n.s.	- attention deficit	n.s.	
	- depression	n.s.	hyperactivity disorder (ADHD)		
			- ODD	n.s.	
Middleton et al. (2009)	- internalising problems	n.s.	- externalising problems	$p < .01$	
Ramchandani et al. (2005)	- emotional problems	sign.	- CD	sign.	Odd Ratio used in analysis, no p-values provided
			- ADHD		
Ramchandani, O'Connor et al. (2008)	- emotional problems	$p < .05$	- CD	$p < .05$	Results significant/ not significant compared to control group
			- ADHD		
Ramchandani, Stein et al. (2008)	- anxiety	n.s.	- CD	$p < .05$	Results significant/ not significant compared to control group
	- depression	n.s.	- ODD	$p < .05$	
			- ADHD	n.s.	

	Emotional problems		Behavioural problems		Note
	Construct	Result	Construct	Result	
Reeb & Conger (2009)	- depressive symptoms	$p < .01$	-	-	
Ringoot et al. (2015)	- emotional problems	T1:	- behavioural problems	T1:	T1 = Assessment at age 3
		FR, MR:		FR, MR:	T2 = Assessment at age 6
		$p < .001$		$p < .001$	FR = Father report
		T2:		T2:	MR = Mother report
		MR:		MR:	CR = Child report
		$p < .001$		$p < .001$	
		CR: n.s.		CR:	
				$p < .05$	
van Roekel et al. (2011)	- depressive symptoms	$p < .01$	-	-	
Velders et al. (2011)	- internalising problems	$p < .001$	- externalising problems	$p < .001$	

	Emotional problems		Behavioural problems		Note
	Construct	Result	Construct	Result	
Weinfield et al. (2009)	- internalising problems	n.s.	- externalising problems	$p < .05$	
Weitzman et al. (2011)	- emotional problems	$p < .001$	- behavioural problems	$p < .001$	
Welner & Rice (1988)	- depression	n.s.	- ADHD	$p < .01$	
			- CD	n.s.	

Note: n.s. = not significant, - = no data available

Discussion

This systematic review explored the relationship between paternal depression and children's emotional and behavioural problems. Importantly, the quality of the studies reviewed was assessed and taken into consideration when reviewing the reported results. As suggested in the AB model in chapter 3 and consistent with earlier reviews (e.g., Connell & Goodman, 2002; Kane & Garber, 2004) paternal depression was strongly associated with higher levels of emotional and behavioural problems in children, with all but one of the studies reporting significant results on at least one domain of child functioning. Twenty out of the 22 studies that considered behavioural problems reported that there was a strong positive relationship between paternal depression and children's behavioural problems; 17 of the 24 studies on emotional problems found significant results.

Meadows et al. (2007) failed to find a relationship between paternal depression and emotional or behavioural problems. One potential explanation could be the young age (one to three years) of the participating children. Ramchandani and Psychogiou (2009) suggested that child age could be a moderator when examining this relationship. Connell and Goodman (2002) also reported that there were larger effects in studies with older children, implying that paternal depression might only have a serious impact on children after extended exposure due to the duration of paternal depression or when a certain level of cognitive-emotional development has occurred. However, significant effects were found in other studies that also included young children (e.g., Weinfeld et al., 2009). Therefore, the assumption of an age effect could not be convincingly supported. The authors explained that their findings might be non significant because they only included data of fathers with a clinical diagnosis of depression derived from structured interviews. However, paternal depression was reported to be associated with higher levels of child problems by Brennan et al. (2002), Ringoot et al.

(2015) and Welner and Rice (1988) who also used structured interviews validated for providing a clinical diagnosis of depression. Additionally, Meadows et al. (2007) did not provide any information about the criteria participants had to fulfil to become eligible for their study, so conclusions about sampling issues could not be drawn. Meadows et al.'s (2007) overall study quality was acceptable, one strength of the study being the large number of fathers included in the sample. Consequently, the absence of significant findings for fathers cannot be attributed to that methodological weakness.

Strengths and Limitations

Strengths and limitations of the studies included in this review. Strengths and limitations of the studies were introduced in the results section. In summary, an important limitation evident in a number of studies was the small number of fathers as participants. This might be due to the difficulty in recruiting fathers into research studies (Vogel, 2011). Some fathers may not live in the same household as the child (Mitchell et al., 2007), thus making it difficult to include fathers.

The majority of the studies in this review included fathers with all levels of depressive symptoms without using specifiers such as the onset of the symptoms. This means that fathers who may have experienced a brief depressive episode at the time of assessment were included alongside those who had experienced symptoms for years. Some authors have suggested that chronicity of parental depression could be related to increased child behaviour problems (e.g., Beardslee et al., 1998). However, a closer look showed that the studies reviewed by Beardslee et al. (1998) only included mothers. Other researchers, who also focused on mothers found the opposite effect; the duration of maternal illness did not increase or decrease children's

behaviour problems. Researchers have yet to examine the effects of chronicity and severity of paternal depression on child functioning.

The assessment tools and forms used by the studies included in this review can be critiqued. None of the studies included in this review used a gender-sensitive assessment tool for the assessment of paternal depression. As pointed out in chapter 1, general assessment tools tend to assess more traditional symptoms of depression, and might fail to detect depression in males who often experience more non-traditional symptoms of depression such as alcohol abuse or overinvolvement in work. Furthermore, according to Friedlander, Weiss, and Traylor (1986), depressive mothers tend to rate the behaviour of their children more negatively than healthy parents, which might also apply to fathers. The studies included in this review did not compare the parents' ratings to clinician ratings and therefore this hypothesis could neither be accepted nor declined. The accuracy of the assessment instruments used in the majority of the studies in this review could thus be criticised, and future research should aim to reduce this potential bias.

Lastly, the studies presented in this review only presented a narrow population group (predominantly Caucasian families). Cross-cultural research is needed to see if the results demonstrated can be extrapolated to other cultures.

Strengths and limitations of this study. Due to the different research designs of the studies reviewed, a meta-analysis could not be conducted to directly compare results and draw firm conclusions. Only data on paternal depression and children's emotional and behavioural problems was extracted from the studies as these are the most commonly studied domains of child functioning. Choosing these domains allowed for the inclusion of a larger number of

studies to compare their findings. Nevertheless, paternal depression might also affect other domains of child functioning, such as physical or cognitive functioning.

Another limitation is that many of the studies assessed variables other than depression and child problems, which may have had an influence on the relationship between depression and child problems but were not considered here (e.g., anxiety; Hautman et al., 2015). As aforementioned, depression and anxiety show high comorbidity rates. Fathers are not only at an increased risk of experiencing depressive symptoms following the birth of their child but also appear to be particularly prone to experiencing anxiety in the months post the child's birth (Matthey, Barnett, Howie, & Kavanagh, 2003). Despite this, the research on paternal anxiety is even more limited than the research investigating paternal depression. Matthey et al. (2003) emphasised the need to include anxiety screenings in addition to depression screenings in men and women who have just become parents. Matthey et al. (2003) reported that by including anxiety disorders, the prevalence rate for a mood disorder (defined as depression or anxiety by the authors) increased up to 100% for fathers compared to the rate for depression on its own. Matthey et al.'s (2003) study showed several strengths, such as the inclusion of a moderately large sample size of fathers and the use of a clinical interview for the assessment of depression and anxiety. The research findings on the relationship between paternal anxiety and child functioning, however, are not only sparse but also inconsistent. Some researchers reported that paternal anxiety is related to poorer overall child functioning. For example, Hautman et al. (2015) found a significant positive correlation between paternal anxiety and child externalising and oppositional defiant symptoms. In contrast, other researchers highlighted that the association between anxiety and child functioning was only significant for mothers, not fathers (Capron et al., 2015, Van Batenburg-Eddes et al., 2013). It can be argued that the different findings might be related to the different constructs measured. Hautman et al. (2015) focused on aggressive/antisocial behaviours in children, whereas

Capron et al. (2015) studied child anxiety and Van Batenburg-Eddes et al. (2013) examined attention problems. More studies are needed to examine the relationship between paternal anxiety and child functioning in more detail.

As pointed out in Study 1, Hautman et al.'s (2015) study showed several methodological limitations, such as including a very specific sample group, not clarifying their attrition rate or not considering the risk of potential confounders. This needs to be acknowledged when considering the study's findings. Capron et al.'s (2015) study also showed some significant limitations. Anxiety was only measured antenatally in fathers and ante- and postnatally (at 8 weeks) in mothers. Child functioning was measured at child age 18. The time period in between the parental and child assessment is very large. Whilst the study considered potential confounders, these were restricted to maternal and child characteristics before or immediately after birth. No confounders that could have had an effect over the period of 18 years, such as the families socio-economic status, marital status or life events were considered. Considering this, it can be questioned whether child functioning (i.e., anxiety) at 18 years of age can be seen as a true effect of parental antenatal anxiety. Van Batenburg-Eddes et al. (2013) also measured antenatal anxiety. Child functioning (i.e., attention problems) was assessed at child age 3. The authors included a wide range of confounders (e.g., SES) and over 3000 fathers, strengthening the validity of their findings.

Another variable assessed by some studies (e.g., Davé et al., 2008), but which did not receive further attention in this review was parenting stress. Davé et al. (2008) assessed fathers' parenting stress, which as proposed in the AB model (Figure 2) may be related to child functioning and depression. Unfortunately, Davé et al. (2008) did not present their findings on this variable. As aforementioned, researchers studying the relationship between depression and child functioning in mothers reported that depressed mothers experience

significantly more parenting stress (e.g., Cardoso et al., 2010), which in turn has been associated with higher levels of child behaviour problems (Meppelder, Hodes, Kef, & Schuengel, 2015). Furthermore, Belsky (1984) proposed that variables associated with parental depression, such as low social support and low marital satisfaction (Committee on D.P.P.H.D.C., 2009) are likely to add to parenting stress if parents feel they have to handle the childcare by themselves or are in disagreement with their partners. It remains unclear if paternal depression is also associated with higher rates of parenting stress and whether this has an impact on their children's functioning, as this variable was not considered in this review.

This review considered only articles retrieved from an electronic database search that were written in English. Ideally, future reviews should consider literature that is written in languages other than English so that all relevant articles are identified, which may also help the identification of possible cultural differences. Given that the clear majority of the studies ($n = 20$) were conducted in the USA or Europe, it remains unclear if the results reported can be generalised to populations from other countries, such as New Zealand. No study exploring the effects of paternal depression on child functioning has been conducted in New Zealand to date, which highlights the need for an empirical study on this subject.

This systematic review also has several significant methodological strengths. It was based on a clearly defined research question and inclusion criteria. Attempting to take account of all possible relevant studies, five major databases were searched, which allowed the inclusion of a broad range of literature. Keywords were systematically chosen and selection criteria for this review were developed, stated and explained in detail to offer transparency and allow replication of the systematic search. Even studies that were still in press were considered so that the most recently conducted studies were included. The SIGN

methodological checklist for cohort studies was adapted for the purpose of this study and used to assess the quality of the studies included in this review. The checklist has been used by other studies and has been rated as the most appropriate assessment tool for cohort studies (Bai et al., 2012). This review had a more specific focus than previous research and provided a quality rating of the studies. Prior to conducting this review, there was a lack of prospective research in this area.

Conclusion

On reviewing the research evidence, similarly to mothers, much support has been provided for the negative impact of paternal depression on children's functioning. In the majority of the studies reviewed, depression in fathers was reported to be strongly associated with emotional and/or behavioural problems in their children. Most of the studies were conducted in the USA and Europe; no research study on paternal depression and child functioning has been conducted yet in New Zealand and it remains unclear if New Zealand fathers believe depression affects their parenting behaviour and, in turn, their children. Moreover, depressive symptoms often do not present in isolation but in co-occurrence with other disorders, such as anxiety, which can also be a significant feature of depression. However, previous studies have often failed to consider anxiety when examining paternal depression. Additional variables may also play a role in the relationship between paternal depression and child functioning; some, such as parenting behaviours and marital satisfaction have been suggested in the AB model but only few studies have empirically tested this relationship for fathers. These research gaps highlight the need for an empirical study that examines the relationship between paternal depression and anxiety, child functioning and further variables such as parenting behaviours and marital satisfaction. This study was conducted and the results are presented in chapter 5.

Chapter 5: The Relationship Between Paternal Depression, Parenting Behaviour and Child Functioning: An Exploratory Study (Study 2)

In this chapter the relationship between paternal depressive symptoms, anxiety, parenting behaviour and children's emotional and behavioural functioning were explored in a quantitative study with a sample of NZ fathers. Based on the AB model outlined in chapter 3, marital satisfaction, work and parenting behaviours were also considered, and their relationship to paternal depression and child functioning explored.

Introduction

The findings from Study 1 (chapter 4) indicate that a strong link exists between paternal depression and emotional and behavioural child functioning. To date, no New Zealand study has investigated this relationship. Prevalence rates of depression in NZ fathers are estimated to be at 4.3% (Underwood et al., 2017). More empirical studies are also required to explore the effects of paternal anxiety on children, because previous studies have typically failed to screen for anxiety in fathers when assessing depression. Existing studies showed inconsistencies in their results, with some reporting that paternal anxiety is related to child functioning, and others who did not find this effect (Capron et al., 2015; Hautman et al., 2013; Van Batenburg-Eddes et al., 2013).

It was proposed in the adapted Belsky model that the relationship between parental depression and child functioning might be affected by parenting behaviours. Belsky (1984) also proposed that unemployment and marital functioning have an impact on parenting behaviours and child functioning. Unemployment also appears to be a risk factor for depression in men (Ballard et al., 1994) and depression can also be associated with lower marital satisfaction (e.g., Johnson & Jacob, 1997). Some researchers have suggested that paternal depression does not only affect marital functioning but the functioning of the whole family, which is often impaired if a parent experiences depression (Wang, Mansfield, Zhao, & Keitner, 2013). This might be caused by the increased conflicts and more negative communication styles found in these families (Jacob & Johnson, 2001; Ramchandani & Psychogiou, 2009). Past studies used the terms marital functioning and family functioning interchangeably even though family functioning includes all family members and not only the parents (e.g., Ramchandani et al., 2011). As a consequence, family functioning may have a different impact on the relationship between paternal depression and child functioning, as the children are directly involved and thus may be more affected. Lastly, previous studies have mostly neglected to assess male-specific symptoms of depression.

Purpose Of This Study

This project aimed to address limitations of previous studies as outlined above by conducting a survey of New Zealand men to explore their perception of how depression affects their role as a father and whether they perceive the depression has an impact on their parenting behaviours and their children. Male-specific symptoms of depression were included in the assessment. A paternal anxiety measure was included to establish the role of anxiety in relation to paternal depression and child functioning and additionally, marital satisfaction,

family functioning, unemployment and social desirability were considered.

The following research questions were examined:

1. Do fathers perceive their mental health affects their role as a father?
2. What kind of relationship exists between paternal depression and emotional and behavioural child functioning from the fathers' perspective?
3. Do fathers' parenting behaviours, unemployment, marital and family functioning have an impact on this relationship?

Method

To investigate the research questions under consideration, an online survey was designed using Qualtrics (Qualtrics, 2016). The survey incorporated a range of questionnaires: the details are outlined below. This method was chosen to target a wide range of fathers to reflect the diversity of the NZ population. The design allowed fathers to complete the survey in their own time and space, to fit in with work hours and other commitments. In addition, the survey design provided a semi-anonymous setting; fathers could complete the questionnaires on their own and identifying data was kept separately from the main survey to ensure confidentiality. The full survey can be found in Appendices A and B.

A sample size of 385 was determined using a population size of 4.51 million (estimated population 2014; Statistics NZ, 2015), a 5% margin of error, and 95% confidence interval. Rounding this up, it was attempted to recruit a sample size of 400 NZ fathers to achieve sufficient power. However, the actual recruitment number was significantly lower (discussed further below) and as a result analyses can only be seen as exploratory. The survey was launched on Qualtrics in March 2015 and closed in May 2016.

Recruitment

Brochures and flyers were designed for the study and were available in a printed and digital version (Appendix C). Additionally, a Facebook site (<https://www.facebook.com/fatherandchildstudy>) was created to increase recruitment numbers. The site was visited by 311 men and received 41 likes. The flyers provided information about the study, the Facebook page, the contact details of the researcher and the survey link (URL website address). Potential participants could contact the researcher via email or phone, ask questions and, if they wished to participate, they received the survey link via email. They could also access the survey directly without contacting the researcher by entering the link provided on the flyers in their internet browser.

Participants were randomly recruited through contacting 138 health centres and medical practices of general practitioners, 100 psychology centres and private practices of clinical psychologists and counsellors throughout New Zealand. The professionals were contacted via phone, email, post or, if situated in Christchurch, mostly in person, and the brochures and flyers about the survey were handed out to them or their receptionists. The Royal New Zealand Plunket Society was contacted in May 2015 and the study went through an application process to get approval from the society's ethics committee. Approval was given on the 10th of June 2015 to contact Plunket centres and to ask them to put flyers and brochures about the study on display at their centres. The Plunket head offices of all 16 districts of NZ were contacted and asked for participation and the distribution of the flyers and brochures, which were then sent to the offices via post.

In addition, flyers were placed in seven libraries in Christchurch, in various buildings at the University of Canterbury and the Christchurch Polytechnic Institute of Technology (now ARA Institute of Canterbury) and local buses (Redbus), after approval was sought and given. Brochures were also placed on the windscreens of cars in Christchurch parked around sport fields and playgrounds, and handed out in person at local sport games and farmer's markets on numerous occasions over the period of the survey. Altogether, about 150 flyers and approximately 1000 brochures were used for the recruitment. In addition, an advertisement about the study was published in the local newspaper on the 23rd of April 2015 (The Star). This newspaper was selected, as it is freely available to all Christchurch residents. Furthermore, 14 NZ mental health organisations, men's clubs and other websites that are likely to be visited by men were contacted and asked to distribute the brochures in their newsletter if available, or to share the Facebook link. In addition, 43 sports clubs nationwide were contacted and offered to be visited to receive further information in person. Despite all of these efforts, it was difficult to recruit a large number of men for this study.

Participants

Ninety-seven fathers (NZ residents) gave consent to participate; however, the final sample consisted of 58 fathers (39% attrition) of two-parent heterosexual families with at least one biological child, aged between 2-18 years, who lived in the same household as the father at the time of recruitment. Fathers were asked to provide information about their youngest and, if present, oldest child to allow the detection of possible age differences. The restriction of $N = 2$ children was chosen as it reflects the average number of children per family in NZ (1.9; Statistics New Zealand, 2001; same number projected in the long-term, Statistics New Zealand, 2016). In addition, including a larger number of children would have increased the length of the survey significantly. To avoid fathers selecting specific children

that may be particularly challenging, and to increase the likelihood of including children from all age groups, fathers were asked to provide data on their youngest or only child (YC) and their oldest child (OC).

Procedure

The participants were provided with a detailed information sheet (Appendix D) and a consent form (Appendix E) online. After agreement was given, they were asked to fill out the survey that took approximately 30 - 40 minutes to complete. The main survey consisted of seven measures:

1. Social desirability test (M-C SDS SF; Reynolds, 1982)
2. Anxiety screening (DASS21-A; Lovibond & Lovibond, 1995)
3. Paternal depression screening (CESD-R; Eaton, Muntaner, Smith, Tien, & Ybarra, 2004)
4. Marital satisfaction (DAS; Spanier, 1976)
5. Child functioning (SDQ; Goodman, 1997, 1999)
6. Paternal parenting behaviour (PS; Arnold, O'Leary, Wolff, & Acker, 1993)
7. Family functioning (GF-FAD; Epstein, Baldwin, & Bishop, 1983)

The survey originally started with the depression screening. However, due to the attrition of a number of participants ($n = 26$ of $N = 66$, attrition = 38%) the order was changed to the above, as it was hypothesised that men might find it easier to respond to questions about their answer tendencies (social desirability test) than to respond at the start to questions about their mental health (anxiety/depression screening).

The participants were asked to fill out all questionnaires and, at the end of the main survey, they were provided with a link, which took them to a second part on a new page

asking for their demographic information. The survey was split into two survey parts to keep identifying data (demographics) separate from the questionnaire data (self-reports) to ensure confidentiality. Participants that provided an email address went into a draw to win an iPad Mini as a compensation for their participation. The study was approved by the Human Ethics Committee of the University of Canterbury (Ref: HEC 2015/09).

Measures

Participants completed the following questionnaires:

Depression. The Centre for Epidemiologic Studies-Depression Scale Revised (CESD-R; Eaton, Muntaner, Smith, Tien, & Ybarra, 2004) was used to measure depression in fathers. This assessment tool was originally developed by Radloff (1977) and was revised in 2004 by Eaton et al. to measure depression as defined in the DSM-IV. It is one of the most widely accepted self-report questionnaires for depression. The CESD-R is a valid assessment tool for assessing depression in community settings (e.g., Van Dam & Earleywine, 2011) and has strong psychometric properties. Eaton et al. (2004) reported good internal reliability scores ($\alpha = .93$). Van Dam and Earleywine (2011) noted a high internal consistency (sample 1: $\alpha = .923$; sample 2: $\alpha = .928$); high convergent and divergent validity when compared with other measures such as the Positive and Negative Affect Schedule (PANAS; negative affection: $r = .58, p < .01$; positive affection: $r = -.26, p < .01$).

The CESD-R consists of 20 items assessing depressive symptoms from nine different groups such as sadness, loss of interest, sleep and guilt. The CESD-R covers the DSM-IV criteria for depression (Eaton et al, 2004). Participants were asked how often they felt or behaved in a certain way in the last two weeks. Depressive symptoms were assessed on a 5

point Likert-scale ranging from “Not at all or less than 1 day a week” to “Nearly every day for 2 weeks”. Based on the authors’ recommendations, fathers were classified as experiencing depressive symptoms if they obtained a score > 16 in the CESD-R.

A modified version of the CESD-R was also included in this study. The questionnaire was modified by including eight additional items that are likely to detect male specific symptoms of depression such as substance (ab)use (see Appendix F). Beforehand, a systematic literature search was conducted across the databases Embase and PsychInfo to identify articles that studied the differences between depression in men and women or looked at depression in men in general. The following keywords were used: *depression* or *depressive disorder* or *depress** and *gender* or *gender difference* and *men* or *male* or *masculine*. Relevant articles were selected and their full texts were examined to identify symptoms of depression in the male population. Results were compared across studies and the most common symptoms were extracted for the purpose of this study. These were an increase in alcohol consumption (particularly), feeling stressed/burned out, social withdrawal, increased feelings of anger, decrease in sexual interest, emotional control, suicidal tendencies and over involvement in work. The findings were compared to already existing tools for the assessment of male depression (e.g., Masculine Depression Scale; see chapter 1 for details). In a next step, items were designed assessing the symptoms above to create a modified version of the CESD-R that includes male-specific symptoms of depression. The assessment format was based on the original CESD questionnaire.

In addition to the questionnaire, questions about the onset and treatment of depression and other mental health disorders were assessed in the survey (e.g., “Have you ever been treated for depression (e.g., psychotherapy, counselling, taking medicine etc.)?”). Fathers were also asked if they believed their mental health affected their role as a father (yes/no).

Furthermore, it was assessed if fathers felt the mother of the children experienced mental health problems and was, at the time of the study, or had ever been, in treatment for mental health problems. These questions were designed by the researcher of the present study and all were based on a dichotomous answer format and provided the option to write down the name of the mental health disorder if applicable.

Anxiety. To assess fathers' anxiety levels, the anxiety scale of the Depression Anxiety Stress Scales 21 (DASS21-A, Lovibond & Lovibond, 1995) was included in the survey. The original version of the DASS includes 42 items and has shown strong psychometric properties, as has the DASS21. The internal consistency of the total score is reported to be $\alpha = .88$, the internal consistency of the anxiety scale itself $\alpha = .77$ (Tran, Tran & Fisher, 2013). The DASS21 is a valid tool for both clinical and community populations (e.g., Antony, Bieling, Cox, Enns, & Swinson, 1998).

The anxiety scale consists of seven items, using a 4-point Likert scale answer format ranging from *never* to *almost always*. A score can be calculated independently from the other two scales (depression and stress). Scores between 6-7 have been classified as “moderate anxiety”, 8-9 “severe” and scores over 10 as “extremely severe”.

Child functioning. The English (Austral) version of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997, 1999) was used to assess emotional and behavioural child functioning. Many researchers have confirmed the strong psychometric properties of the SDQ for the assessment of child functioning (Hawes & Dadds, 2004; Woerner et al., 2004). The SDQ has a moderate to strong internal reliability ($\alpha = .59 - .82$) across the scales and high stability ($r = .61 - .77$) scores (Hawes & Dadds, 2004). Mathai, Anderson, and Bourne (2004) compared the diagnoses resulting from the SDQ with those made by an independent clinician

or a clinical team, and they found significant correlations between those ($\tau = .26 - .43$ clinician versus $\tau = .39 - .56$ clinical team, all $p < .001$) and concluded that the SDQ can be seen as a “useful instrument to aid clinicians in diagnosis and could be used as part of the initial assessment process”. Smits et al. (2016) compared the use of the SDQ in clinical vs. community samples and reported favourable results in both settings.

On five scales the SDQ screens for the following symptoms in children: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour. It consists of 25 items (5 per scale) and a brief impact supplement. For the purpose of this study the parent forms for three age bands were used: 2 - 4 years, 4 - 10 years and 11 - 17 years. The SDQ has been used adequately with 18-year-olds before (e.g. He, Burstein, Schmitz, & Merikangas, 2013) and was therefore used for children up to 18 years of age in this study. The answers were given on a 3-point Likert-scale (“Not true”, “Somewhat true” and “Certainly true”). Total difficulties scores $\geq 17/20$ were classified as high/very high by the developers, with an exception being the age group 2 - 4 where total scores $\geq 16/19$ are considered as high/very high emotional and behavioural difficulties. This was taken into account when analysing the data.

Additionally, fathers were asked how much they were in charge for the care of their child and if (and how much) they were engaged in their child’s activities (both in per cent).

Marital satisfaction. To assess marital satisfaction the Dyadic Adjustment Scale (DAS; Spanier, 1976) was used. Amongst others, Carey, Spector, Lantinga, and Krauss (1993) reported a high internal consistency and stability of the DAS with Cronbach’s alpha scores between .70 and .95 for the four scales and the total score. The DAS has also been

found to be a reliable assessment tool for marital satisfaction in community samples (e.g., Cuenca Montesino, Gómez, Fernández, & Rodríguez, 2013).

Within 32 items the DAS determines the degree of dissatisfaction couples may experience. The four scales measure dyadic consensus, cohesion and satisfaction as well as affectional expression. In addition, a total score can be calculated. The answers are mostly designed using a 5-6 point Likert-Scale, with only two items having a dichotomous answer format. A cut-off score of 100 was suggested by Spanier (1976) to distinguish between distressed and non-distressed couples, with higher scores reflecting a better relationship.

Paternal parenting behaviours. The Parenting Scale (PS; Arnold, O’Leary, Wolff, & Acker, 1993) was used to measure dysfunctional parenting behaviours. Hurley, Huscroft-D’Angelo, Trout, Griffith, and Epstein (2014) conducted a review of the psychometrics of parenting measures. They stated that the Parenting Scale “had the most acceptable reliability ratings in internal consistency, test-retest and cross-informant reliability” of the measures included in their review. The parenting scale shows a moderate-to-high reliability with internal consistency scores ranging from .63 to .84 (Cronbach’s alpha) amongst the scales. Test-retest correlations were reported to be between .79 and .84 (Arnold et al., 1993).

The Parenting Scale was originally divided into the following scales: over-reactivity, laxness and verbosity. Due to the fact that a large number of studies could not find any significant effects for the verbosity scale and the fact that only low consistency scores were reported for this scale, a new model was applied by Rhoades and the original co-author O’Leary and validated in a community sample (2007). The new model uses the same measure developed by Arnold et al. (1993) but divides it into the scales over-reactivity, laxness and hostility (Rhoades & O’Leary, 2007). They stated that the new factor ‘hostility’ makes a

significant contribution to the scale. Rhoades and O’Leary (2007) defined the scales as follows: The over-reactivity scale focuses on harsh, emotional, authoritarian discipline and irritability; the laxness scale covers permissive and inconsistent discipline, and the hostility scale includes items that assess the use of verbal or physical force. Fathers in the current study were asked to complete the 30 items such as “When my child misbehaves...I raise my voice or yell/I speak to my child calmly” on a 7 point Likert-scale. To calculate the total and subscale scores their sum is divided by the number of items. A clinical cut-off score of 3.2 was suggested for the total score with higher scores reflecting more dysfunctional parenting behaviours being used.

Family functioning. To examine family functioning, the General Functioning Scale of the Family Assessment Device (GF-FAD; Epstein, Baldwin, & Bishop, 1983) was used. Kabacoff, Miller, Bishop, Epstein, and Keitner (1990) tested the Family Assessment Device in clinical and nonclinical samples and stated that the FAD scales showed good psychometric properties across populations. Researchers over time reported that the General Functioning Scale shows good psychometric properties even when used on its own (Byles, Byrne, Boyle, & Offord, 1988; Bylund et al., 2016). With only 12 items it focuses on the general functioning in families (decision making, communication, expressed emotion). Answers were assessed on a 4 point Likert-scale ranging from “Strongly Agree” to “Strongly Disagree”. A cut-off score of 2 was suggested for the general functioning scale with higher scores reflecting more pathology.

Social desirability. The short-form (C) of the Marlowe Crowne Social Desirability Scale (M-C SDS SF; Reynolds, 1982) was used to assess if participants show a social desirability bias in their answers. Many authors have stated that the original 33 items form (Crowne & Marlowe, 1960) has good psychometric properties. Reynolds (1982) reported that

the short forms also show an acceptable level of reliability ($\alpha = .76$) in a community sample. Robinette (1991) confirmed that the short form C achieves good validity scores when compared with the L (.59), F (-.52) and K (.54) scale of the Minnesota Multiphasic Personality Inventory. The short form consists of 13 items such as “No matter who I’m talking to, I’m always a good listener.” The participants were asked to answer with “True” or “Not true”. Higher total scores reflect a tendency to respond in a socially desirable way.

Demographics. Basic demographic data was retrieved based on the recommendations given by Statistics New Zealand. Age, ethnicity, education level, occupation status and the current district of residence were assessed. Fathers’ age was split into seven groups starting with <20 up to >64 as recommended by Statistics New Zealand. The questionnaire covered eight ethnic groups (NZ European, Maori, Samoan, Cook Islands Maori, Tongan, Niuean, Chinese, Indian), and an additional “Other” category with the option to fill in their ethnic origin. The participants’ educational level was assessed, looking only at their highest post-school qualification, distinguishing between ‘no qualification’, ‘tertiary qualification’ and ‘other’ (e.g., student). The participants were also asked to provide information on their occupation status (employed, self-employed, unemployed, studying, other).

Participants also addressed the number of children they had, and their gender and age were assessed. Child age was split into three groups to match the different age bands used on the SDQ (2-4, 5-10, 11-18). They were asked to provide data on their youngest or only child (YC) and their oldest child (OC) as outlined above. Whilst it is likely that the YC group may include a larger number of younger children, both groups (YC/OC) may include children from all age groups. Fathers were asked additional questions in relation to their children, which were designed by the researchers of this study, such as if they live with their child (yes/no),

how much they are in charge of the care of the child, and if (and how much) they were engaged in their child's activities (both in per cent).

Data Analyses

The questionnaire data and fathers' demographic data was assessed in two separate parts and also analysed separately to ensure confidentiality. Numbers varied, as not all fathers completed the second (demographic) part of the study. Descriptive statistics and correlations were computed using SPSS 22 (IBM Corp., 2015). The normality distribution of the continuous variables was tested via Shapiro-Wilkinson tests and, due to non-normality of some variables, non-parametric tests were used for the analyses. Depression was first analysed as a continuous variable using the original CESD-R and then a distinction between fathers with scores >16 and <16 was made to explore differences between fathers who are likely to be depressed and non-depressed fathers using Mann-Whitney U tests. Emotional and behavioural child difficulties were calculated for the youngest child and oldest child separately to compare these. Spearman's ρ was calculated to examine correlational relationships between the variables. Due to the low number of fathers participating in this study some of the planned analyses could not be conducted and the results should be considered as exploratory.

Results

Demographic Characteristics of the Sample

Fifty-eight fathers completed all questionnaires (40% attrition). Fourteen of the 58 fathers chose not to provide demographic details about themselves. The majority (52.3%) of the 44 fathers who provided information were 40 to 49 years old. Ninety-three per cent

classified themselves as NZ European, including one participant who also identified as Maori, and 6.8% of participants chose the category “other” (e.g., Australian; see Table 5). Fathers were residing in 12 out of the 16 districts of New Zealand with almost half of the participants residing in Canterbury. Eighty-four per cent of fathers had a tertiary qualification and 93% were in employment. None of the fathers reported being unemployed. The demographic details can be found in Table 5.

Table 5

Study 2: Demographic Data - Fathers

	%	<i>n</i>
Ethnicity		
NZ European	93.2	41
Maori	0.0	0
Samoan, Cook Islands Maori, Tongan, Nieuuan, Chinese, Indian	0.0	0
Other	6.8	3
Age		
< 20	0.0	0
20-29	4.5	2
30-39	25.0	11
40-49	52.3	23
50-59	15.9	7
60-64	0.0	0
> 64	2.3	1
Post-School Education		

Tertiary qualification	83.7	36
No qualification	9.3	4
Other	7.0	3
Occupation		
Employed	83.7	36
Self-employed	9.4	4
Studying	2.3	1
Retired	2.3	1
Unemployed	0.0	0
Other	2.3	1
Residence		
Northland	2.3	1
Auckland	13.6	6
Waikato	4.5	2
Bay of Plenty	0	0
Gisborne	0	0
Hawke's Bay	2.3	1
Taranaki	2.3	1
Manawatu-Wanganui	2.3	1
Wellington	18.2	8
Tasman	2.3	1
Nelson	2.3	1
Marlborough	2.3	0
West Coast	2.3	1
Canterbury	45.5	20

Otago	0	0
Southland	2.3	1

All fathers reported on their youngest or only child (YC; $n = 58$), and more than half of the fathers had another child aged 2-18 years of age (OC; $n = 33$) for whom they completed the questionnaires, resulting in a total sample of 91 children (see Table 6). Fifty (55%) were male and 41 (45%) female children. Children of all age groups were represented with almost half of the children fitting in the 5-10 years age group (48%; see Table 6). This was still true when splitting the children in the YC and OC group: the majority in each group were 5 – 10 years old (YC: $n = 24$; OC: $n = 18$); the numbers for children aged 11 – 18 years were equal across the groups ($n = 12$). However, there were a significantly larger number of 2 - 4 year old children in the YC group (YC: $n = 22$; OC: $n = 3$). The largest proportion of fathers had two children (41.4%), followed by one child (24.1%). When asked how much fathers feel they are in charge of their children's care, less than half of the fathers reported being in charge of their children for 50% or more of the time, suggesting that the mother or another family member is the primary caregiver. All but one father said they were involved in their child's activities.

Table 6

Study 2: Demographic Data – Children

	%	N
Number of children in family		
1	24.1	14
2	41.5	24
3	17.2	10
4	8.6	5
5 or more	8.6	5
Gender child		
Male	54.9	50
Female	45.1	41
Total age child in years		
2-4	23.5	21
5-10	48.0	44
11-18	28.5	26
Per-centage father in charge of child ≥50%		
YC	44.8	26
OC	39.4	13
Per-centage father involved in child's activities		
YC	98.3	57
OC	97.0	32

Note: YC = youngest or only child, OC = oldest child

Participant Characteristics

Depressive symptoms. As shown in Table 7, fathers had a mean of 12.05 ($SD = 11.89$) on the CESD-R, indicating that fathers on average experienced distress levels below the suggested cut-off of 16 for depression (Eaton et al., 2004). Thirteen fathers (22.4%) had scores above the cut-off, indicating that they were likely to experience depression. One participant met the criteria for major depressive disorder (MDD); four probably met the criteria for MDD according to the algorithm proposed by the developers of the CESD-R (Eaton et al., 2004); and the remaining eight participants did not meet the criteria for MDD but a “depressive syndrome may be present”. Almost 30% ($n = 17$) of the fathers who participated in this study have been in treatment for depression previously and 10.3% ($n = 6$) were currently in treatment for depression. Forty fathers (69%) reported that they believed their mental health affects their fathering role.

Anxiety symptoms. The mean score on the DASS-A was 2.86 ($SD = 3.93$); 3.4% ($n = 2$) of fathers yielded moderate scores on the DASS-A; 5.2% ($n = 3$) reported to experience severe anxiety, and 8.6% ($n = 5$) extremely severe anxiety.

Child functioning. The youngest or only children (YC) had a mean of 9.86 ($SD = 5.11$) on the SDQ. Approximately three per cent ($n = 2$) were reported as having high and 5.1% ($n = 3$) had very high levels of emotional and/or behaviour problems. A very similar distribution was found for the oldest children (OC), who had a mean of 9.97 ($SD = 5.68$); 1.7% ($n = 1$) experienced high, and 5.1% ($n = 3$) very high emotional and/or behavioural problems. In total, 9.9% ($n = 9$) of children had either high or very high total scores on the SDQ.

Marital satisfaction. More than half (56.1%) of fathers had scores over 100 ($M = 98.33$, $SD = 27.67$) on the DAS, indicating a satisfactory marital relationship.

Parenting behaviour. Thirty-two per cent of fathers had scores on or over the cut-off of 3.2 ($M = 2.95$, $SD = 0.64$) on the PSI suggesting a higher usage of dysfunctional parenting practices. In regard to the subscales, 19% of fathers had high laxness scores, 6.9% high hostility scores and 27.6% high overreactivity scores.

Family functioning. The mean score for family functioning using the GF-FAD was 1.70 ($SD = 0.048$), which suggests that on average fathers perceived their families function well. However, 27.6% of fathers reported impaired family functioning.

Social desirability. Only 15.5% of fathers received scores in the top third of the SDS ($M = 6.88$, $SD = 2.69$). Hence, the majority of fathers answered the questionnaires truthfully.

Table 7

Study 2: Participant Characteristics

	<i>N</i>	<i>Mean</i>	<i>SD</i>
Paternal depression (CESD-R)	58	12.05	11.89
Child functioning (SDQ)			
YC	58	9.86	5.11
OC	33	9.97	5.68
Anxiety symptoms (DASS-A)	58	2.86	3.93
Marital satisfaction (DAS)	57	98.33	27.67
Parenting behaviour (PS)	58	2.95	0.64
Family functioning (GF-FAD)	58	1.70	0.48
Social desirability (M-C SDS SF)	58	6.88	2.69

Note: YC = youngest child, OC = oldest child

Research Question 1: Impact of Mental Health on Fathering

The clear majority of fathers (69%, $n = 40$) reported that they believed their mental health affected their role as a father.

Research Question 2: Perceived Relationship Between Depression and Child

Functioning

Paternal depressive symptoms were significantly associated with fathers' reports of children's emotional and behavioural functioning for the youngest child or only children ($r_s = .28, p = .037$) but no relationship was found for the oldest child-group ($r_s = .32, p = .068$).

Research Question 3: Impact of Paternal Anxiety, Parenting Behaviour, Unemployment, Marital Satisfaction and Family Functioning on Depression and Child Functioning

Given the exploratory nature of this study, moderator variables could not be controlled for but key relationships were explored (see Table 8). Paternal depressive symptoms were strongly positively correlated to paternal anxiety ($r_s = .64, p < .001$), parenting behaviours ($r_s = .28, p = .037$) and family functioning ($r_s = .28, p = .032$). Paternal depression was negatively correlated to marital satisfaction ($r_s = -.43, p = .001$). Paternal anxiety was also significantly correlated with marital satisfaction ($r_s = -.31, p = .018$) and parenting behaviours ($r_s = .29, p = .028$). Unemployment could not be examined as a variable, as all of the participants were in employment at the time of the study.

Marital satisfaction, parenting behaviours and family functioning were significantly associated with child functioning. Higher levels of marital satisfaction, the use of fewer dysfunctional parenting behaviours and better family functioning were related to lower rates of child problems: (marital satisfaction: $r_s = -.36, p = .005$; parenting behaviours: $r_s = .33, p = .012$; family functioning: $r_s = .37, p = .005$). However, these results only applied for the youngest or only children. Considering the oldest child-group, a significant relationship was only revealed for family functioning; better family functioning was associated with fewer emotional and behavioural problems in the OC group ($r_s = .48, p = .005$). Paternal anxiety was not associated with child emotional or behavioural problems for the YC, nor the OC group.

Table 8

Study 2: Spearman Correlations Between Depression, Child Functioning and Co-Variables

	1	2	3	4	5
		YC	OC		
1. Paternal depression					
2. Child functioning					
YC	.28*				
OC	.32				
3. Anxiety symptoms	.64***	.05	.31		
4. Marital satisfaction	-.43**	-.36**	-.31	-.31*	
5. Parenting practices	.28*	.28*	.28	.29*	-.18
6. Family functioning	.28*	.37**	.47**	.20	-.65***
					.39**

Note: YC = youngest child, OC = oldest child. * $p < .05$, ** $p < .01$, *** $p < .001$

Differences Between Depressed and Non-Depressed Fathers

Analyses were conducted comparing depressed and non-depressed fathers based on a cut-off score of 16 as recommended by the authors of the CESD-R (Eaton et al., 2004) in order to identify any differences between the two groups. Fathers who experienced depressive symptoms ($n = 13$) suffered from significantly higher rates of anxiety than non-depressed fathers ($n = 45$; $U = 77.0$, $p < .001$). Depressed fathers also reported the usage of dysfunctional parenting skills more often ($U = 155.5$, $p = .011$). No significant effects were found for the remaining variables. It is to be stressed that these results are only exploratory due to the insufficient participant numbers.

Table 9 presents participants' responses on the additional items, which gives an indication about how frequently specific male depressive symptoms were reported. The highest scores were found for the item "I was less interested in sex than I used to be" and the item "It was important for me to stay in control of my emotions" (both 19%).

Table 9

Study 2: Additional Depression Items – Fathers Responses in %

	Per-centage fathers (N)			
	Rarely or none of the time	Some or little of the time	Occasionally or a moderate amount of time	Most or all of the time
Alcohol increase	69.0 (40)	22.4 (13)	6.9 (4)	1.7 (1)
Stress	22.4 (13)	44.8 (26)	20.7 (12)	12.1 (7)
Family- Withdrawal	65.5 (38)	20.8 (12)	3.4 (2)	10.3 (6)
Anger	53.5 (31)	25.9 (15)	10.3 (6)	10.3 (6)
Decreased sexual interest	56.9 (33)	15.5 (9)	8.6 (5)	19.0 (11)
Emotion control	39.6 (23)	29.3 (17)	12.1 (7)	19.0 (11)
Suicidal thoughts	91.4 (53)	5.2 (3)	1.7 (1)	1.7 (1)
Increased work hours	69.0 (40)	13.8 (8)	13.8 (8)	3.4 (2)

Discussion

Due to the small numbers of fathers who participated in the study, the results can only be considered as exploratory. Whilst the majority of fathers (69%) in the present study

believed that their mental health generally affected their role as a father, fathers' reports on the CESD-R and SDQ only revealed a significant relationship between paternal depression and child emotional and behavioural functioning for the youngest or only children. Fathers who experienced greater levels of depressive symptoms reportedly had children who experienced higher rates of emotional or behavioural problems. Paternal depression was also associated with higher levels of paternal anxiety, a greater use of dysfunctional parenting behaviours, lower levels of marital satisfaction, and poorer family functioning.

Paternal depressive symptoms were only related to child functioning for the youngest or only children. Younger children often spend more time with their fathers, which means they are likely to be more exposed to their fathers' depressive symptoms. Older children may have already developed coping strategies to protect themselves from their father's negative affect. However, in contrast, no age effect was evident in Study 1, as all studies included in the review reported significant effects across all ages. Previous research investigations could also not find any support for an age effect (e.g., Connell & Goodman, 2002). The insufficient sample size might be a reason for the absence of a significant relationship between paternal depression and child functioning for the OC group. Moreover, YC and OC groups' main difference was birth order (youngest compared to oldest child), which has not been examined by previous studies.

The correlation between paternal depression and anxiety was expected due to the high comorbidity rates of the two disorders (Oakley Browne, Wells, & Scott, 2006). Paternal anxiety was not found to be statistically related to children's emotional and behavioural functioning. Previous studies found mixed effects (Capron et al., 2015; Hautman et al., 2013; Van Batenburg-Eddes et al., 2013) and it was suggested that the variance in findings may be

explained by the different aspects of child functioning measured. Paternal anxiety may affect only specific areas of child functioning.

This study found several significant effects aside from the main association under investigation. In accordance with previous research findings (e.g., Cumming, Keller, & Davies, 2005) and the AB model of this thesis, fathers who reported higher rates of paternal depressive symptoms reported to be less satisfied in their marital relationship. This can be explained by the increased negativity/decreased positivity in relationships with a depressed partner. For instance, Gabriel, Beach, and Bodemann (2010) showed that couples with a depressed husband report significantly lower levels of non-verbal positivity than couples with a depressed mother or couples with no depressed partners. In contrast, Johnson and Jacob (1997) found that couples with a depressed wife showed the lowest levels of positive communication when compared to couples with a depressed husband or non-depressed couples. Gabriel and others (2010) also found that depressed men (and women) in maritally distressed couples showed more defensiveness, criticism and aggression (Gabriel et al., 2010). It should be noted though, that the sample sizes in both studies were small, and therefore the effects found may be specific to the samples used and thus, larger studies are needed.

Keeping the negative behaviours (e.g., higher levels of criticism and aggression) found in couples with a depressed husband in mind, it is perhaps not surprising that child functioning was significantly linked to marital satisfaction. The link between marital satisfaction and emotional and behavioural child functioning is well established, with higher rates of marital satisfaction being associated with better child functioning (e.g., Cummings & Davies, 2010). This finding supports the addition of this pathway to Belsky's model of parenting in this thesis. It was unanticipated however, that this result was identified for the youngest or only child (YC), and not for the oldest child (OC). There are a couple of possible

explanations for this finding. Firstly, the younger child may have been perceived as being more challenging and thus could affect the marital relationship to a greater extent. However, considering child functioning as measured by the SDQ, the YC-group did not have higher levels of emotional and behavioural problems than the OC-group. Another hypothesis is that older children might be less affected by marital dissatisfaction, because researchers have found that they are often better able to cope with stressors and can remove themselves from the situation by spending time away from home (Cummings & Davies, 2010; Goeke-Morey, Papp, & Cummings, 2013). Marital satisfaction and family functioning were strongly correlated. However, only family functioning was associated with emotional and behavioural child functioning in both child groups; the different effects confirm that the two variables are likely to be distinct and should be analysed separately.

A considerably large percentage of fathers (almost 25%) in this sample reported experiencing depressive symptoms. This is higher than the national prevalence rates of 4.3% for postnatal paternal depression (Underwood et al., 2017) and 11.4% for male depression (Oakley Browne et al., 2006). Further analyses were conducted to explore differences between depressed and non-depressed fathers. The results showed that depressed fathers experienced significantly more anxiety and reported a significantly higher usage of dysfunctional parenting behaviours in comparison to parenting of non-depressed fathers. Wilson and Durbin (2010) also showed in their meta-analysis that paternal depression seems to be associated with a higher usage of dysfunctional and a lower rate of positive parenting practices. Dysfunctional parenting practices were only related to child functioning in the youngest child in this study. There were considerably more under four-year olds amongst the YC group, and as such indicating that parenting practices might have a stronger impact on younger children. As described above, this might be due to younger children being more dependent on their parents, and spending more time with them than older children or

adolescents, who tend to spend more time in educational settings or with peers (Bornstein, 2002). This would be in accordance with social learning theory. Bandura (1977) proposed that children are more likely to imitate behaviours the more time they spent with the model and if they felt closer to the modelling person.

Strengths and Limitations

Despite employing a wide range of recruitment strategies across multiple times, and using an online survey design which, among others, permitted participants to complete the questionnaires in their own time and addressed common issues such as confidentiality, the sample size was small ($N = 58$). As such, the interpretation of the results has to be done with much consideration, and the results do not permit generalisations to other populations. It is a well-established finding that men can be difficult to recruit for research studies (Sherr, Davé, Lucas, Senior, & Nazareth, 2006; Vogel, 2011). One potential reason explicating this outcome is that fathers are typically the main economic provider in families (Goldman, 2005), often work more paid hours than women, and may perceive they do not have enough spare time to participate in research studies (Mitchell et al., 2007). An online survey was employed to address the probable time issue, making the survey accessible from any location and possible to complete over several sessions, but the length of the survey itself might have still had an impact on fathers' willingness to complete it. However, research reviewing the impact of survey length on response rates reported that results across studies do not consistently show that survey length has a significant effect on the response rate (Stoop, 2012). Despite the advantages of an online survey design mentioned above, the response rates generally appear to be lower than for paper-pencil surveys or face-to-face interviews (Couper, 2000).

Men are typically less likely to talk about feelings in regard to mental health, which was expected of them in this study (Lewis, 2003). Berger, Addis, Green, Mackowiak, and Goldberg (2013) showed that a reason for this could be the societal norms and practices for men. The authors argue that men are ‘rewarded’ for “being stoic, emotionally restrictive, and denying physical or mental vulnerability” (Berger et al., 2013, p. 433). Newberger (1999) states that gender differences regarding emotional expressiveness start in childhood through parents’ parenting behaviour. According to Newberger (1999), parents express a larger variety of emotions to girls than boys, and boys are taught to express fewer emotions. Considering the key variable of this paper – depression – it was found that men experience stigma towards the term, and it was less accepted than other psychological disorders, such as anxiety (Berger et al., 2012; Magovcevic & Addis, 2005), which may have affected men’s willingness to participate in this research study. Darwin et al. (2017) reported that men rather talk about stress instead of mental health.

Despite including a wide range of variables that could have moderated the relationship between paternal depression and child functioning, these could not be statistically tested due to the small sample size of the study. In addition, it was originally planned to conduct a second study examining maternal effects, as some researchers (e.g., Ramchandani et al., 2005) suggested that maternal depression may be a significant moderator when examining the relationship between paternal depression and child functioning. However, due to the small sample size this study was not implemented, and consequently the effects that maternal depression might have had on this relationship could not be studied.

Only the domains emotional and behavioural child functioning were considered in this study, as these are the most commonly studied domains which cover a wide range of child difficulties. As a consequence, the relationship between paternal depression and other

domains such as physical or cognitive functioning still remain unclear. Moreover, only the youngest and oldest child of each family was considered in the examination, to reduce the survey length, leaving it unclear what impact additional children might have had on fathers' experience of depression and their parenting behaviours.

Additional variables, such as parenting stress, were suggested as possibly important contributors to the relationship between paternal depression and child functioning. These were not investigated in this study as this would have extended the survey length significantly, which could have affected fathers' willingness to participate.

The study also has a number of methodological limitations, such as splitting the survey in two parts, which was performed to keep any identifying data separate. After completing the questionnaires, participants had to perform the additional task of opening the second survey part and entering the link they had been provided with in the main survey. It can be questioned whether this design was the cause for a moderate number of participants not completing the demographic questions, as these were only asked in the second part. The data analysis in the present study was correlational and therefore does not imply any causality. Furthermore, despite pointing out that fathers had to be cohabitating with their children to be able to participate in the study, a small number of fathers did not reside with one ($n = 1$) or any of their children ($n = 4$) at the time of the survey: three of these fathers reported that they still see their child 2-3 times a week, one father said he would see his children once a week, and only one father reported not having regular contact with his children. Due to the low numbers of non-resident fathers, additional tests were not run to test whether the relationship between paternal depression and child functioning was different for non-resident fathers than resident fathers.

The results of this study were based on fathers' perception and reports, which may or may not be accurate, as fathers' ratings could have been affected by their mental health. The self-report questionnaires used for the assessments do not only underlie the risk of being subjective, but also do not justify a clinical diagnosis of depression; at its best, the assessment tools could suggest if an individual is likely to experience MDD. Therefore, it can be questioned whether the high rates of fathers experiencing depression would also have been found if the assessment had been conducted by an independent clinician using a clinical interview. Finally, as Davé, Petersen, Sherr, and Nazareth (2010) stated, "(t)here remains a dearth of longitudinal research on both maternal and paternal depression" (p. 1038).

Despite marked limitations, this is the first study to date that examined paternal depression and its association with emotional and behavioural child functioning in a New Zealand sample. Research on paternal depression has been limited around the world and particularly in New Zealand. A thorough search of the literature yielded only one recently published (February 2017) study that examined paternal depression in a New Zealand sample, but did not consider how fathers' depression may affect their children. Understanding this relationship better can aid in finding ways to minimise the negative impact of paternal depression and prevent later child difficulties. Additionally, this study aimed to examine the relationship between paternal depression and a wide range of factors that might have an impact on the relationship between paternal depression and child functioning. By developing an online survey, fathers from all parts of the country and different backgrounds could participate in the study to reflect the general New Zealand population.

Implications for Future Research

Further research needs to be done to examine the effects of paternal depression on children. A larger NZ based study is needed to examine if and how paternal depression affects their children across different age groups. Some researchers have argued that the time around birth, when both parents attend hospital services, might be a good time to assess depression in fathers (Vogel, 2011). Moreover, as noted in previous chapters, this seems to be the time period when depression levels are the highest for fathers (and mothers). More longitudinal studies examining the effect of assessment time of paternal depression are needed.

Even though the use of online surveys has advantages, the response rates still seem to be lower than offline assessments (Couper, 2000), suggesting that in order to increase participant numbers future research on paternal depression should consider paper-pencil mail surveys or face-to-face assessments, over the use of an online survey. Face-to-face assessments could also include an independent assessment by a clinician to avoid reporter bias. Another suggestion would be to target large companies and other workplaces and ask for permission to hand out the survey during break times. In regard to using a survey design, it can be questioned whether it would be beneficial to assess depressive symptoms as part of a general health survey, instead of with a survey that specifically looks at depression, to avoid stigma around the term depression. It can be questioned whether it would have been advantageous to use the term stress over depression. As aforementioned, a reduction of the survey length might also increase response rates; however, research findings on this subject are inconclusive. Some researchers have argued that recruitment rates were higher in studies that offered pre-assessment or immediate post-assessment compensations, and reported that draws as used in the present study seem to be less successful as an incentive (Manzo & Burke, 2000).

Furthermore, more extensive research focussing on the development or validation of gender-sensitive depression tools is needed to ensure that depressed men do not fall through the net when it comes to the identification of depressive symptoms, given that they may express depressive symptoms differently. Furthermore, it is unclear whether paternal depression might have a larger impact on other domains of child outcomes than emotional and behavioural functioning. There is a dearth of research on the effects of paternal depression on children's cognitive and physical functioning. Studies focussing on mothers found that maternal depression is associated with poorer cognitive and physical child functioning (Liu et al., 2017; Stewart, 2007). Clearly, further studies are required, to examine if the same relationship exists with fathers.

In addition, future studies should consider additional variables such as parenting stress, which appear to affect parents and children and might moderate the relationship between paternal depression and child functioning as postulated in chapter 3. Lastly, longitudinal studies are needed to identify the causes and mechanisms of paternal depression, but most of the current studies are cross-sectional studies.

Conclusion

In conclusion, fathers perceived that their mental health affects their role as a father. However, the results on the CESD-R and the SDQ only revealed a relationship between paternal depression and child functioning for the youngest or only children. Paternal depression was linked to increased paternal anxiety, a higher usage of dysfunctional parenting practices, decreased marital satisfaction and poorer family functioning.

Poorer child emotional and behavioural functioning was significantly associated with less marital satisfaction, more dysfunctional paternal parenting practices and poorer family functioning. However, some effects could only be found for the youngest or only children. A larger study is needed to allow any generalisations to be made and to examine the impact of paternal depression in more detail, including other domains of child functioning, such as cognitive and physical functioning.

In addition, variables such as parenting stress and its relationship to depression have been studied and reviewed for mothers, and researchers found that depressed mothers experienced significantly more parenting stress than non-depressed mothers. It was suggested in the AB model that this association might also be significant for fathers. It is possible that parenting stress levels are different for mothers and fathers. Parenting stress levels could in fact be lower for fathers, as mothers are still the main caregivers and fathers tend to spend less time with their children. However, one could also argue that as the often primary economic provider, fathers might spend more time at work, leaving less time at home to fulfil the demands of parenting, resulting in higher stress levels. Moreover, it is also possible that parenting stress is a risk factor for depression, or depression may cause parenting stress. Therefore, the relationship between paternal depression and parenting stress is reviewed in the following chapter to draw a clearer picture of this relationship and to examine whether fathers experience lower levels of stress than mothers. The directionality of the relationship between paternal parenting stress and depression is also considered. This is followed by a study examining the relationship between depression, parenting stress and child functioning, and two studies that explore the determinants of parenting stress in fathers compared to mothers.

Chapter 6: Paternal Depression and Parenting Stress: A Review of the Literature (Study 3)

This chapter reviews the literature on the relationship between paternal depression and parenting stress to examine, if any, the direction of this relationship. Depression may be a predictor of parenting stress or stress could be a determinant of depression. Gender role differences in parenting stress levels are also examined, however, the focus is on fathers given that to date no review has been conducted that considered the relationship between stress and depression in fathers. If depressed fathers experience more parenting stress this might aid to further explain why paternal depression is associated with poorer child functioning.

Introduction

It was suggested in the adapted Belsky model that parents' mental health might affect their parenting behaviours and parenting stress levels. It was suggested in the previous chapter that depression and anxiety are associated with a greater use of dysfunctional parenting behaviours, thus, confirming this pathway. Depression and anxiety have been reported to function as predictors of maternal parenting stress (Gelfand, Teti, & Fox, 1992; Huizink et al., 2017). No review has been published to date that examined the relationship between depression and parenting stress in fathers, leaving it unclear if there is a common agreement that paternal depression is associated with higher levels of parenting stress as reported for mothers. Fathers have become increasingly more involved in childcare but they are often still

less involved than mothers (Lamb, 2010) and thus, one could argue that fathers may experience less parenting stress than mothers. Some researchers found support for this: fathers experienced lower levels of parenting stress compared to mothers (Doering, Moser, & Dracup, 2000). However, more research is needed to compare parents stress levels and thus, this review (Study 3) was conducted.

Purpose of This Review

The purpose of Study 3 is to review the empirical literature on paternal parenting stress and its relationship with paternal depression and anxiety in order to answer the following questions:

1. Do fathers report significantly lower levels of parenting stress than mothers?
2. Is paternal depression associated with higher levels of parenting stress?
3. If paternal depression is related to parenting stress, what is the direction of this relationship? Is depression a predictor of parenting stress or does parenting stress predict fathers' depressive symptoms?
4. If paternal anxiety was assessed, is there a significant relationship between paternal anxiety and parenting stress?

Method

This review was conducted in September 2016. The following databases were searched: Embase (1974 to present), PsychArticles (1987 to present) and Medline (1946 to present). For the purpose of this study paternal parenting stress was defined as symptoms of stress experienced in relation to parenting in fathers (parental role stress and child rearing

stress). Paternal depression was defined as symptoms of depression in fathers. Given that the focus of this review lies on the relationship between paternal depression and parenting stress, the search focused on this. Anxiety was only considered if the studies assessed this simultaneously. The following keywords were used for the literature search: *parenting stress* or *parental stress* and *depression* or *depressive symptoms* and *father* or *paternal*.

The initial search resulted in 176 articles. After deleting duplicates 134 articles remained and the following criteria (inclusion criteria 1) were applied: included were studies that assessed the relationship between depression and parenting stress in fathers at any stage following their child's birth. Studies may or may not include an assessment of paternal anxiety. Depression was defined as the experience of depressive symptoms of any severity or chronicity. Fathers could be biological, step or adoptive fathers of any sexual orientation. Children of any age and any ability were included to allow the identification of possible differences in the levels of parenting stress experienced by their fathers. Stress was defined as parenting stress, therefore studies that looked at posttraumatic stress, life stress, exclusively hormonal stress levels, and pre-natal stress were excluded. Also excluded were non-empirical studies, studies in languages other than English and articles with no published full text (e.g., conference abstracts). Twenty-three articles remained and their full texts were screened employing one further criterion: studies had to provide separate data for mothers and fathers in order to allow examining paternal effects separately. Seventeen records remained and were included in the review (see Figure 3).

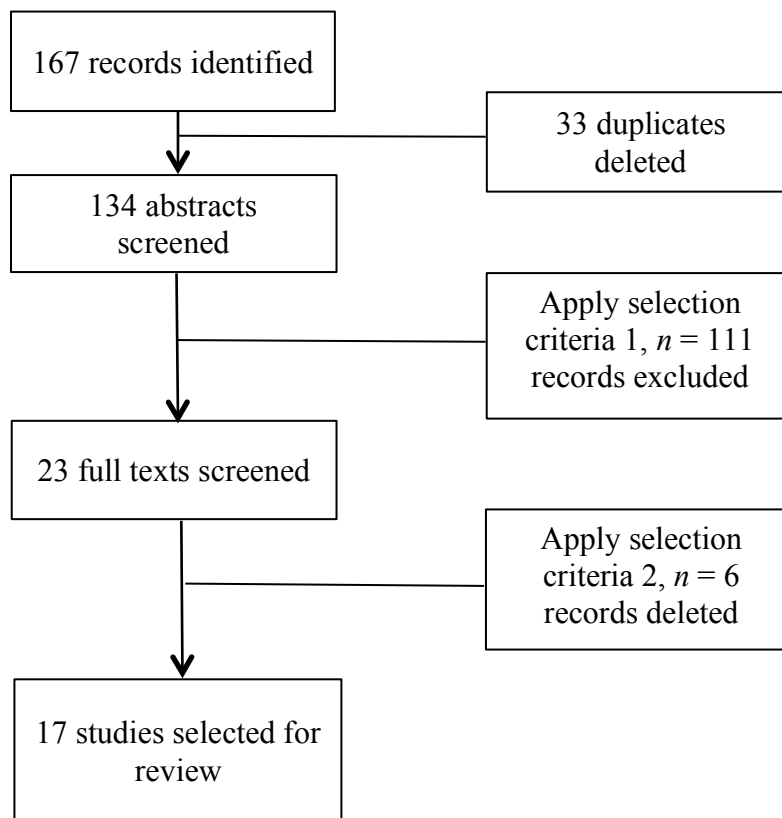


Figure 5. Study 3: Flow chart study screening

Results

Study Characteristics

The studies were published between 1998 and 2016 with 12 studies being published in the last five years. Most of the studies looked at specific participant groups with only four studies using participants from the general population (Anding, Röhrle, Grieshop, Schücking, & Christiansen, 2016; Epifanio et al., 2015; Ponnet et al., 2013; Seah & Morawska, 2016). Seven of the 17 studies focused on parents of children with various disabilities (García-López, Sarriá, E., & Pozo, 2016; Giallo et al., 2015; Kersh, Hedvat, Hauser-Cram, & Warfield, 2006; Ozturk, Riccadonna, Venuti, 2014; Van Steijn, Oerlemans, Van Aken, Buitelaar, & Rommelse, 2014; Wanamaker & Glenwick, 1998; Yang, Du, Gong, Liu, & Kutcher, 2016), predominantly disorders on the autistic spectrum (4/7). Two studies considered parents of

preterm infants (Castel et al., 2016; Huhtala et al., 2011) and another two included families with mental health problems (Goodman, 2008; Mothander & Moe, 2010). Lee, Fagan, and Chen (2012) used a sample of fathers from the Fragile Families and Child Well-Being study sample and Saisto and colleagues examined women with low-risk pregnancies and their partners respectively (Saisto, Salmela-Aro, Nurmi, & Halmesmäki, 2008). The numbers of fathers included in studies varied immensely from $n = 22$ (Wanamaker & Glenwick, 1998) to $N = 1403$ (Lee et al., 2012). Most studies ($n = 11$) used the EPDS, BDI or the CESD to assess paternal depression. Only three out of the 17 studies assessed paternal anxiety; the assessment was conducted using the HADS (Garcia-Lopez et al., 2016), the DASS (Giallo et al., 2015) or the SCL-R-90 (Ozturk et al., 2014). Thirteen out of seventeen studies used the Parenting Stress Index (short or long form) as a measurement of paternal parenting stress, the remaining studies used the German Parent Stress Questionnaire (Elternstressfragebogen; Anding et al., 2016), the Parenting Hassles Scale (Gallo et al., 2015), the Swedish Parent Stress Questionnaire (Mothander & Moe, 2010) and the Child Rearing Stress Scale (Ponnet et al., 2013). All but one study (Epifanio et al., 2015) assessed further variables, such as child behaviour problems, marital satisfaction and social support. Presented in Table 10 are the characteristics of the studies; the research questions (1, 2, 3a, 3b) outlined earlier were answered by extracting the relevant data from the studies and either affirming the research question (✓), negating it (✗) or stating where the data was not available to make any statements (NA).

Table 10

Study 3: Characteristics and Results of the Studies

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
Anding et al. (2016)	Germany	General population	276	2 weeks	EPDS	Parental Bonding Inventory (PBI),	✗	NA	NA	✓	NA
					Elternstressfragebogen (ESF = German Parent Stress Questionnaire)	socioeconomic status (SES), major life events, history of psychiatric treatment, experience of pregnancy & birth, history of child violence, puerperal complications					
Castel et al. (2016)	France	Parents of preterm vs. full-term	65	18 months	EPDS	Neonatal Behavioural Assessment Scale	✗	✓	NA	NA	NA
					Parenting Stress Index Short Form (PSI-SF)						

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
infants											
Epifanio et al. (2015)	Italy	General population	53	< 1 month	EPDS	-	✗	✗	NA	NA	NA
Garcia-Lopez et al. (2016)	Spain	Parents of autistic (ASD) children	76	3 – 18 years	HADS PSI-SF	HADS (anxiety), Childhood Autism Rating Scale (CARS), Behaviour Problems Inventory (BPI), Positive Contribution Scale (Kansas Inventory of Parental Perceptions; KIPP), Parent Sense of Competence (Brief Psychological Well-	✓	✓	NA	NA	✓

Study	Country	Sample	<i>N</i>	Child age	Depression & Parenting	Measure (other)	Research Question			
			(F)		Stress Measures		1	2	3a	3b
						being (Spanish versions)				4
Giallo et al. (2015)	Australia	Parents of children with an intellectual disability	252	3 – 15 years	Depression Anxiety Stress Scales (DASS) Parenting Hassles Scale (PHS)	DASS (anxiety), Developmental Behaviour Checklist (DBC), PSOC, sources of support	✓	NA	✗	✓
Goodman (2008)	USA	Depressed vs. non- depressed women & partners	128	2 – 3 months	EPDS PSI-SF	Dyadic Adjustment Scale (DAS), Mother's/ Father's Questionnaire (e.g., past/current psych. treatment), Nursing Child Assessment Teaching Scale (NCATS)	NA	✓	NA	NA
Huhtala et	Finland	Parents of	182	2 years	BDI	Bayley Scales of Infant	✗	✓	NA	NA

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
al. (2011)		VLBW			PSI	Development (BSID),					
		infants				Parental Sense of					
						Coherence Scale					
Kersh et al. (2006)	USA	Parents of children with disabilities	67	10 years	CESD PSI	Family Experiences Questionnaire (FEQ), Child Behaviour Checklist (CBCL), Family Support Scale, Vineland Adaptive Behaviour Scales- Interview Form, DAS, SES	✗	✓	NA	NA	NA
Lee et al. (2012)	USA	Adolescent vs. older	1403	3 – 5 years	Composite International Diagnostic Interview	Paternal involvement, being booked/charged,	NA	✗	NA	NA	NA

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
		fathers from the Fragile Families and Child Well- Being Study			Short Form (CIDI-SF, through self reports) PSI-SF	marital relationship, young motherhood, social support, child temperament, EAS temperament questionnaire					
Mothander & Moe (2010)	Sweden	Parents of infants at a mental health clinic	43	0 – 4 years	CESD	Diagnostic Classification of Mental Health and Developmental Disorders of Infance and Early Childhood	✓	✓	NA	NA	NA
Ozturk et al. (2014)	Italy	Parents of ASD children	49	7 years (M)	Symptom Checklist-90- Revised (SCL-90-R) PSI-SF	SCL-90-R (anxiety), Parental Style Questionnaire (PSQ),	✗	✓	✓	NA	✗

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
						Self-Perceptions of the					
						Parental Role (SPPR),					
						Autism Diagnostic					
						Observation Schedule-					
						Generic (ADOS-G)					
Ponnet et al. (2013)	Belgium	General population	196	10-18 years	CESD-8 Child Rearing Stress Scale	Open Family Communication Scale	NA	✓	NA	NA	NA
Saisto et al. (2008)	Finland	Low risk pregnant women & partners	155	Pregnancy, 2 – 3 months & 2 – 3 years	BDI-R PSI-SF	Rosenberg’s Self-Esteem Scale, NEO Personality Inventory (NEO-PI), Pregnancy Anxiety Scale, DAS, social strategies	✗	NA	✓	NA	NA

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
Seah & Morawska (2016)	Australia	General population	71	< 6 months	EPDS PSI-SF	Maternal Infant Responsiveness Instrument (MIRI), Family Support Scale (FSS), Social Support Scale (SSS), Maternal Efficacy Questionnaire (MEQ), Maternal/Paternal Postnatal Attachment Scale (MPAS, PPAS)	✕	NA	✕	NA	NA
Van Steijn et al. (2014)	Netherlands	Parents of ASD and/or ADHD	174	5 – 19 years	General Health Questionnaire (GHQ-12/28)	Adult's Social Behaviour Questionnaire (ASBQ), ADHD-Conners Adult	✓/✕	✓	NA	NA	NA

Study	Country	Sample	N	Child age	Depression & Parenting	Measure (other)	Research Question				
			(F)		Stress Measures		1	2	3a	3b	4
		children and unaffected siblings			PSI-SF	Rating Scales-Self-report (CAARS), self-reported autism spectrum quotient (AQ)					
Wanamaker & Glenwick (1998)	USA	Parents of children with cerebral palsy	22	3 – 7 years	BDI PSI	PSOC, Social Support Questionnaire-6 (SSQ6), Eyberg Child Behavior Inventory (ECBI)	✓	✓	NA	NA	NA
Yang et al. (2016)	China	Parents of ASD vs. non-ASD children	361	6 years (M)	Zung Self-Rating Depression Scale (Zung SDS) PSI	Autism Behavior Checklist (ABC), Gong revision of the Eysenck Personality Questionnaire (EPQ)	NA	✓	NA	NA	NA

Note: F = fathers; ✓ = yes; ✗ = no; NA = not available.

- 1 = Fathers experienced significantly less parenting stress than mothers (Yes/No/NA)
- 2 = Paternal depression and parenting stress were significantly correlated (Yes/No/NA)
- 3a = Paternal depression was a significant predictor of parenting stress (Yes/No/NA)
- 3b = Parenting stress was a significant predictor of paternal depression (Yes/No/NA)
- 4 = A significant relationship between paternal anxiety and parenting stress was identified (Yes/No/NA)

Research Question 1: Gender Differences in Parenting Stress Levels

Findings varied across the studies when assessed for research question 1 “Do researchers report that fathers experience significantly lower levels of parenting stress than mothers?” Seven studies found no significant differences in parenting stress across gender but one study (Huhtala et al., 2011) found that fathers experience significantly more parenting stress on certain subscales (i.e., child adaptability, child hyperactivity) and no differences on the other subscales (i.e., parent competence). Five studies reported that mothers experienced higher stress levels than fathers; this includes one study (van Steijn et al., 2013) where this only applied in certain cases (e.g., children with ASD only). Considering the age or disability status of the children included in the studies did not aid explaining the mixed findings in parenting stress levels as all age and ability groups were represented across the studies. Significant findings were found regardless of the stress measurement used. However, three of the studies that reported that fathers experience lower levels of stress than mothers (Garcia-Lopez et al., 2016; Mothander & Moe, 2010; Wanamaker & Glenwick, 1998) only included limited numbers of fathers ($n = 22 - 76$) restricting the generalisability of their results. The remaining four studies did not compare parenting stress scores for fathers and mothers (Goodman, 2008; Lee et al., 2012; Ponnet et al., 2013; Yang et al., 2016).

Research Question 2: Existence of a Relationship Between Depression and Parenting Stress

Of the 13 studies that presented data on whether paternal depression and parenting stress were related, 11 reported a significant correlation between the two variables of interest with higher levels of depression being associated with higher levels of parenting stress. No age or developmental ability effects were identified. Epifanio et al. (2015) and Lee et al. (2012) did not find a significant association between paternal depression and parenting stress.

Epifanio et al. (2015) only included $n = 53$ fathers in their study of whom only three were at risk of clinical PPD. Fathers high parenting stress scores could be related to the fact that the assessment was conducted within the first month post the child's birth rather than being a result of paternal depression. Fathers stress levels might be heightened given that they have to adjust to the new parenting role and face challenges within the weeks after becoming a fathers, such as coping with sleep deprivation or having to provide additional resources for the new family member. However, Lee et al. (2012) also did not identify a significant relationship between paternal depression and stress despite examining stress when children were three to five years of age. The authors included a large sample size ($n > 1000$) strengthening the validity of the results. It remains unclear why no significant association was found between paternal depression and stress.

Research Question 3: Direction of the Relationship Between Depression and Stress

Only four studies assessed the predictive value of depression; Ozturk et al. (2014) and Saisto et al. (2008) demonstrated that paternal depression seems to predict parenting stress, whilst two studies (Giallo et al., 2015; Seah & Morwaska, 2016) failed to find this relationship. Comparing depression or stress levels or participant characteristics including child age and disability did not explain the difference in findings. However, comparisons of depression and parenting stress levels were restricted as some studies did not present mean scores. Two studies (Anding et al., 2016; Giallo et al., 2015) examined whether parenting stress was a determinant of depression and found that parenting stress functioned a predictor of paternal depression (see Table 10).

Research Question 4: Existence of a Relationship Between Paternal Anxiety and Parenting Stress

The three studies that assessed paternal anxiety and its relationship to parenting stress found inconsistent results. Giallo et al. (2015) reported that stress was a significant predictor of paternal anxiety. Garcia-Lopez et al. (2016) results are in support of this finding: paternal anxiety was associated with higher parenting stress levels. However, Ozturk et al. (2014) could not replicate this result; paternal anxiety was not related to parenting stress. Garcia-Lopez et al. (2015) and Ozturk et al. (2014) both used the PSI to measure parenting stress and included a similar sample group (parents of children with ASD). It can be questioned whether the different measures used for the assessment of anxiety (HADS, SCL-90-R) might have led to the variance in results.

Discussion

The findings reported by the studies included in this review showed mixed results with regards to the research questions considered. No clear conclusion could be drawn on whether fathers experience lower levels of parenting stress when compared to mothers. It was reported consistently across the studies that depression seems to be significantly related to higher parenting stress levels. However, the direction of the relationship between depression and stress could not be clarified.

Parenting stress levels between genders were more similar than different in the studies included in this review. The increased paternal involvement over the last few years could have led to parenting becoming progressively a shared responsibility. Considering this, it does not seem surprising that parents also ‘share’ the negative aspects of parenting such as stress.

However, due to the inconsistency of these findings further research is needed to examine gender differences in parenting stress levels.

The majority of studies reported that paternal depression was strongly related to higher parenting stress levels in fathers, which is in line with research findings examining maternal stress (e.g., Cardoso et al., 2010) and with the adapted Belsky model outlined in Chapter 3. Belsky suggested that parental psychopathology could have a significant impact on the parenting experience. As aforementioned, parenting stress arises if the demands of parenthood exceed the resources of the individual. The symptoms of depression, such as fatigue, might mean individuals experiencing depression have fewer resources to cope with the demands of parenting; consequently leading to the experience of parenting stress.

The direction of the relationship between depression and parenting stress remains unclear due to the very few studies assessing the predictive value of paternal depression on parenting stress, with their findings not all concordant. In regards to the diathesis stress model, one might find support for the hypothesis that parenting stress predicts depression. Thus, parenting stress could be seen as a stressor, which might increase the risk of an individual developing depression. However, based on the AB model, depression is likely to predict parenting stress.

Despite the high comorbidity rates between depression and anxiety, only three out of the 17 studies included an assessment of paternal anxiety. The results of these studies were somewhat mixed with two studies reporting that a relationship exists and one study which did not find a significant association between anxiety and parenting stress.

Strengths and Limitations

Strengths and limitations of the studies included in this review. The studies included in this review had limitations. The majority of studies used a very specific sample group, for example parents of children with ASD (e.g., Yang et al., 2016), making it difficult for any generalisations to other populations to be made. Moreover, as noted before, half of the studies included fewer than 100 men and only four studies included more than 200, which adds to the previous constraint of limiting the generalisability of the findings and the ability to detect true effects if statistical power is low. Not all data required to answer the research questions of this review could be retrieved. The missing results could have helped to get clearer findings on the relationship between depression and stress.

Strengths and limitations of the current review. The topic of this review was very specific and it is likely that other variables, such as the marital relationship or maternal depression might have had an impact on the association between depression and parenting stress. These were assessed by some of the studies, but did not receive further attention in this review given the goal was to examine whether there is any relationship between paternal depression and parenting stress. Possible mediators, such as whether the father was cohabitating with the child were not considered as this would have gone beyond the scope of this review. It is likely, that fathers who did not live with their children experienced lower parenting stress levels. Nevertheless, this review fulfilled its aim of examining the questions considered. By using a broad search strategy fathers from different population groups were included, which may be seen as a limitation as differences between the studies could be sample specific. However, it also allowed for a comprehensive overview of depression and paternal stress under different circumstances. The relationship between parenting stress and paternal anxiety was also considered whenever possible.

Implications for Future Research

Future studies need to include larger numbers of fathers or male caregivers, preferably of the general population to avoid having results that might only be applicable to the specific small sample group. Future studies should examine the role of additional factors in relation to paternal parenting stress in more detail. As suggested in the AB model of this thesis, bonding, personality, marital satisfaction, social adjustment and child functioning may also act as determinants of parenting stress but these were not considered in this review. Moreover, more research is needed to clarify whether depression and anxiety are predictors of paternal parenting stress and whether any mediators exist in the relationship between parenting stress and child functioning, such as resident vs. non-resident fathers or parenting behaviours.

Conclusion

In conclusion, the studies included in this review reported that fathers do not always experience less stress than mothers but the findings were inconsistent. As a consequence, more research is needed to examine gender role differences in parenting stress. One common result across the studies was the significant relationship between paternal depression and parenting stress: fathers who experienced more depressive symptoms appeared to experience higher levels of parenting stress. This is in accordance with the proposed AB model (Figure 2, p. 61), which also suggested a relationship between depression and parenting stress. However, the direction of this association needs further investigation to determine if depression is a predictor of stress. It was emphasised that additional variables such as parental personality are likely to add to fathers' experience of parenting stress and these have been suggested in the AB model of this thesis, but they are yet to be investigated.

The adapted Belsky model also suggests a relationship between parenting and child functioning. Cardoso et al. (2010), for example, tested parts of the model and found a significant relationship between maternal parenting stress and child temperament with mothers whose children displayed a more difficult temperament experiencing higher stress levels. Harewood, Vallotton, and Brophy-Herb (2017) reported that paternal parenting stress is associated with lower cognitive functioning in children. The authors did not include mothers in their study and thus no gender differences could be examined. It has not been examined in this thesis yet whether parenting stress is associated with child functioning, such as emotional, behavioural, cognitive or physical functioning and if so whether this applies for mothers and fathers in the same way.

In addition, the relationship between fathers' depression and children's cognitive or physical functioning has also not been explored; only child emotional and behavioural functioning was considered in Study 1 and 2. Therefore, a large study is needed that examines the relationship between fathers' depressive symptoms, parenting stress and child cognitive and physical functioning which includes both parents to allow the identification of gender role differences.

Chapter 7: The Relationship Between Depression and Anxiety, Parenting Stress and Child Functioning in Fathers and Mothers of NICU and term-born children (Study 4)

It was shown in chapter 6 that fathers who experience depression report higher levels of parenting stress. It remained unclear whether fathers experience similar levels of parenting stress than mothers and whether stress is related to child functioning. In Study 4 presented in this chapter, data previously collected in a large clinical sample of NZ fathers and mothers, who participated in the Parents and Footprint study were used to examine the relationship between their mental health, parenting stress and children's cognitive, physical, emotional and behavioural functioning. A comparison of paternal and maternal depression and anxiety levels and its relationship to child functioning helps gaining a better understanding of the experience of depression and anxiety in fathers as it highlights how paternal depression differs from maternal depression.

Introduction

As described in chapter 3, paternal and maternal depression are associated with less optimal child functioning. Parental anxiety has also been demonstrated as another contributor negatively associated with child functioning (Hautman et al., 2015). The majority of research studies to date have typically focused on mothers. To examine this relationship with fathers, Study 2 was conducted in which the relationship between depression in fathers and their children's emotional and behavioural functioning was explored (chapter 5). Despite results of previous studies indicating that paternal depression was associated with poorer emotional and behavioural functioning in children of all ages (e.g., Davé et al., 2011), a significant relationship was only identified between the two variables in Study 2 for the youngest or only child in each family. Paternal anxiety was not related to child functioning in any of the children. The small sample size of Study 2 may be one of the reasons why the findings of previous studies could only be replicated for some of the children. It also remained unclear whether or not depression has an impact on child domains other than emotional and behavioural functioning, such as cognitive or physical functioning as this was not assessed in Study 2. Mothers were not included in the study and consequently it remains unclear if the results would have been similar or different for mothers.

Further research is also needed to answer the question whether the rates of paternal depression peak within the month after the child's birth as commonly found for mothers. Similar results were suggested for fathers by some researchers (e.g., Davé et al., 2010) but longitudinal studies proving this are rare. As described in chapter 2, the prevalence rates might be higher postnatally due to fathers (not just mothers) experiencing a role shift overnight. Fathers are often less prepared for fatherhood than mothers for motherhood (Wee et al., 2011) and fathers might also feel more economic pressure, as they suddenly have to provide

resources for an additional family member. Moreover, Study 2 found different results for the youngest and oldest child group. Child age varied; future research examining a more homogeneous age group would be of advantage to diminish the possibility of age acting as a mediator.

It was suggested in the AB model and chapter 5 that additional variables should be considered when examining the relationship between paternal depression and child functioning, such as parenting stress. Study 3 compared studies from different populations, which included parents of children with disabilities and from the general population. Both found a relationship between depression and parenting stress. It was not explored whether there was a statistical difference in parenting stress levels between the groups. It could be expected that parents with children with special needs or children who are at risk to develop difficulties, such as prematurely born infants might experience more parenting stress. Parents of prematurely born infants do not only face the typical stressors associated with the transition to parenthood, such as hormonal, role and financial changes or sleep deprivation, but additional significant stressors including whether the infant will survive and if they are going to show a typical development (Carter, Mulder, Darlow, 2007). Admission to the neonatal intensive care is usually unplanned and therefore parents are unprepared and their expectations of becoming a parent most likely differed significantly from the sudden reality of having a child that needs to be admitted to the NICU. Medical concerns around the mother's health are often the reason for delivering an infant prematurely and thus, aside from the concerns around the infant's health, fathers also have to deal with significant concerns around their partner's health (Hagen, Iversen, & Svindseth, 2016). Furthermore, the hospital stay can be perceived as more stressful for both parents due to the physical environment, the limited physical contact or isolation from the child, the appearance of the child and the interactions with members of the clinical team (Arockiasamy, Holsti, & Albersheim, 2008; Carter,

Mulder, Darlow, 2007). After discharge, stressors may persist as preterm born infants or any infants born in the neonatal intensive care unit (NICU) are often more demanding and require extra care compared to healthy-term infants (Howe, Sheu, Wang, & Hsu, 2014). Twenty to forty per cent of very low birth weight children have medical problems that need continuing treatment (Verma, Sridhar, & Spitzer, 2003) and the infant's health issues could persist over years (Saigal, Stoskopf, Streiner, & Burrows, 2001). Considering the definition of parenting stress outlined earlier, stress in NICU parents may be child rearing stress on the one side, caused by medical issues of the child. However, parental role stress may also be experienced as fathers and mothers often feel powerless and helpless during the NICU stay (Arockiasamy et al., 2008) and are often concerned about their ability to care for the preterm infant after discharge from hospital (Olshtain-Mann, O. & Auslander, G.K., 2008). Therefore, parents of NICU infants may experience more parenting stress and that may maintain over time. Stress might also extend to other areas, such as the marital relationship. Researchers have found that a chronic illness of a child can put a strain on the marital relationship due to the wife (or husband) role being replaced as a full-time carer for the child (Manning, 2012).

The contribution of having a preterm or unwell infant to paternal parenting stress was assessed in only one study (Huhtala et al.; 2011) in Study 3 presented in chapter 6. Huhtala et al. (2011) reported that fathers of preterm infants experience higher stress levels than mothers if their child had a cognitive delay at age two. Schappin and others showed in their meta-analysis that parents of NICU children experienced more parenting stress after birth than parents of no-risk children (Schappin, Wijnroks, Uniken Venema, & Jongmans, 2013). However, only 12 of the 38 studies in Schappin et al.'s (2013) meta-analysis included fathers and none of the studies included more than 100 fathers. Researchers have reported mixed results as to whether the increased parenting stress levels in preterm infants persist over time. Treyvaud and others (Treyvaud et al., 2011; Treyvaud, Lee, Doyle, & Anderson, 2014) for

example, found that the differences in stress levels between parents of NICU infants and controls disappear after two years but seem to come back when the children are seven years old. Their results included both parents, however, only 4% of the participants were fathers and the authors did not differentiate between mothers and fathers in their data analysis and potential gender role differences could consequently not be examined. The experience and stressors associated with having a NICU infant may be different for mothers and fathers. For mothers the primary stressor appears to be concerns about their infants' health, whereas fathers are reported to be initially more concerned about the health of their wife and experience their infants' health as a secondary stressor (Hagen, Iversen, & Svindseth, 2016). A main stressor for fathers appears to be feeling out of control, and also the lack of information given to them on both their wife's and infant's health status and progress (Koppel & Kaiser, 2001; Provenzi & Santoro, 2015). Schappin et al. (2013) explored gender differences in their meta-analysis and found that gender role differences in parenting stress levels experienced during the NICU stay are negligible to small. Due to low numbers of fathers involved in those studies, gender role differences in parenting stress post the NICU stay could not be examined. There is generally a lack of research on parenting stress in samples including fathers of NICU infants.

Purpose of This Study

The present study aimed to address the limitations by (1) assessing depressive symptoms in a large sample of NZ fathers and mothers post birth within three weeks (T1) and then again at two years (T2) after the child's birth and (2) examining the relationship between depression and child (infant) functioning. In addition to emotional and behavioural functioning, cognitive and physical child functioning were assessed. Paternal anxiety and the

role of parenting stress were explored (3); and gender role differences discussed (1-3). The following research questions were studied:

1. Do fathers experience higher rates of depression in the weeks after the birth of their child than two years after becoming a father?
2. What kind of relationship exists between paternal/maternal mental health (anxiety and depression) and child cognitive, physical, emotional and behavioural functioning?
3. Is parenting stress associated with paternal and maternal mental health and child functioning?

Method

Participants

Participants in this study were fathers and mothers, who participated in the Parents study (Psychosocial Adjustment RElated to Newborn Trauma) and their infants, who were part of the companion study named the Footprint study (FOllow up Of Tiny PReterm Infants Now Two). The aim of the original studies was a follow-up of the infants and parents of infants admitted to a regional neonatal intensive care unit (NICU) compared with controls. The sample was chosen as it was expected that NICU parents experience significantly higher stress, depression and anxiety levels than parents of healthy, term-born infants. This would allow for comparisons to be made between a potentially highly symptomatic and low symptom group.

NICU Group. Participants were parents residing in the Canterbury province who had an infant admitted to the NICU ward of the Christchurch Women's Hospital between February 2001 and February 2002. Infants were admitted to the NICU if their birth weight was lower than 1800g or if they were born before 34 weeks of gestation or had any illness. Families of infants where it was known that they would go straight into foster care or adoption were not eligible to take part in the study. The sole exclusion criterion was lack of written informed consent. Fathers were included if they were cohabitating with the mother of the baby at time of birth. Two hundred and ninety six families were randomly selected by generating a table of random numbers from the sequential admission register for the NICU in the calendar year 02/2001 - 02/2002 and invited to take part in the study. Two hundred forty-two families gave written informed consent (242 mothers; 205 fathers).

Control Group. The control group were randomly selected families who were residing in the Canterbury province and whose infant was born full-term in the Christchurch Women's Hospital and did not require admission to the NICU. Randomisation was completed by selecting every eighth birth from the full-term sequential admission register, where admission to the NICU was not needed. Hundred twenty families were invited to participate in the study. Of these, 100 families (100 mothers, 89 fathers) agreed to take part. Similarly to the NICU group, fathers were included if they were cohabitating with the mother of the baby at time of birth. The whole sample of the present study consisted of 294 fathers and 342 mothers and their infants. The study was approved by the Canterbury Ethics Committee (00/08/099).

Procedure

Within three weeks of the infants' birth an experienced interviewer met each parent separately at the hospital to conduct the first research assessment. The last assessment was

conducted 2 years after the child's birth either during their routine follow-up appointment at the paediatric outpatient unit at Christchurch hospital or during a home visit. The assessments consisted of a clinical interview and a set of self-report questionnaires as well as a paediatric assessment at age two (corrected age for extent or prematurity) to conduct the Bayley Scales of Infant Development (BSID) by a trained psychologist. For this study data from the self-reports on depression and anxiety from the baseline assessment (T1) and the assessment at 2 years (T2), the parenting stress measurement (T2), demographics and the paediatric assessment at two years corrected age were utilised.

Paternal depression and anxiety. The Hospital and Anxiety Scale (HADS; Zigmond & Snaith, 1983) consists of two subscales measuring anxiety and depression on 14 items with responses ranging from 0 - 3 for each item. Scores range from 0 to 21 for each subscale and 0 to 42 for the total HADS scale, with higher scores reflecting more distress. Both, the total HADS scale and the anxiety and depression subscales were each considered as a continuous scale at T1 and T2 to allow for the identification of distinct effects of depression and anxiety. According to Bjelland, Dahl, Haug, and Neckelmann (2002) a cut-off of eight was proposed for each subscale. Bjelland and colleagues (2002) reported in their literature review a score of $\alpha = .83$ for the anxiety subscale and $\alpha = .82$ for the depression scale for Cronbach's alpha coefficient of internal consistency. They also reported a moderate- to high concurrent validity with several questionnaires, such as the BDI (Bjelland et al., 2002).

Parenting stress. The Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) assesses parenting stress with 36 items on a 5-point Likert scale. The results range from *strongly agree* to *strongly disagree*. The items can be assigned to three subscales (parental distress, parent child dysfunctional interaction, difficult child) and a total score; the latter was used in the present study at T2. Higher scores reflect higher levels of parenting stress and

scores at or above the 85th percentile of the total stress scale reflect clinically significant scores (Abidin, 2012). The PSI-SF has a high internal consistency ($\alpha = .95$ for the total score), construct validity (Reitman, Currier, & Stickle, 2002) and high test-re-test stability (Haskett, Ahern, Ward, & Allaire, 2006).

Child functioning. The Bayley Scales of Infant Development-II (BSID, 2nd ed.; Bayley, 1993) is the primary measure of child functioning. The BSID has been described as the Gold Standard for developmental assessments because of its high psychometric properties (Johnson, Wolke, & Marlow, 2008). It is used to examine different developmental skills in infants from one to 42 months on two main scales (mental and psychomotoric) and also provides a behaviour rating subscale. The Mental Development Index (MDI) assessment involves different tasks to examine cognitive and language skills, such as memory learning, problem solving and verbal communication to examine cognitive functioning. The Psychomotor Development Index (PDI) tests psychomotoric skills such as muscle coordination and postural imitation (Luttikhuisen dos Santos, de Kieviet, Königs, Van Elburg, & Oosterlan, 2013) to examine physical functioning. Data was available for 279 infants on the MDI and 281 on the PDI due to not all infants being capable enough to complete the assessment. The mean score of the MDI and PDI is 100, the standard deviation 15 (Leonard, Piecuch, & Cooper, 2001). Scores of <1SD under the norm are classified as a mild delay, scores of <2SD refer to a severe delay or impairment.

The Behaviour Rating Scale of the Bayleys' screens for emotional and behavioural problems. In the present study infants were classified as having an emotional or behavioural problem if they were classified in the worst category on any of the Bayley ratings for positive affect, negative affect, inattention, activity, cooperation/compliance, and self-confidence/self-reliance. Based on the ratings they could achieve a total score of 0 - 5 problems.

Data Analysis

Preliminary analyses yielded no significant differences between the NICU and control group at 2 years in regards to depression, anxiety and parenting stress levels, which is consistent with previous reports of the Parents study (e.g., Mulder, Carter, Frampton, & Darlow, 2014). As a consequence there was no need to compare NICU with control parents and participants were combined into one group. The normality distribution of the continuous variables was tested via Shapiro-Wilkinson tests and rejected, as a consequence non-parametric tests were used. Mean scores and standard deviations were calculated for fathers, mothers and infants on all variables and for both assessment points (parents data) using SPSS 23 (IBM Corp., 2016). Scores were compared for each parent for T1/T2 using Wilcoxon Signed-Ranks tests and for fathers compared to mothers using Mann-Whitney *U* tests. Child functioning was first considered as a continuous variable and in a further step two additional dichotomous variables for the MDI and PDI were created to analyse the relationship between parental mental health and child functioning in more detail: (1) MDI-1SD/PDI-1SD, which distinguishes between infants with or without a score of at least $<1SD$ under the norm on either of the scales and (2) MDI-2SD/PDI-2SD to classify infants with or without a score of at least $<2SD$ under the norm. Spearman's *rho* was calculated to assess the correlations between the variables.

Results

Demographic Characteristics of the Sample

The demographic characteristics of the sample are presented in Table 11. Fathers had a mean age of 33.3 years and mothers were significantly younger with a mean age of 30.3 years

($p < .001$). Most participants identified as NZ European (80.3%) and were married (88.6%). The only significant difference between the NICU and the control group was the annual income with NICU parents being less likely than control parents to earn over \$70,000 ($p < .001$).

Table 11

Study 4: Demographics of Fathers vs. Mothers in Both Groups

	Fathers (N = 294)			Mothers (N = 342)		
	NICU (n = 205)	Control (n = 89)	Total (n = 294)	NICU (n = 242)	Control (n = 100)	Total (n = 342)
Age	33.1	33.7	33.3	30.1	30.7	30.3
Ethnicity	(5.9)	(6.0)	(6.0)	(5.4)	(5.4)	(5.4)
NZ European						
NZ Maori	82%	83%	82%	77%	82%	79%
Other European	(168)	(74)	(242)	(187)	(82)	(269)
Pacific Islands	4% (8)	3% (3)	4% (11)	7% (16)	4% (4)	6% (20)
Asian	7% (15)	8% (7)	8% (22)	8% (20)	8% (8)	8% (28)
Other	2% (3)	1% (1)	1% (4)	1% (2)	1% (1)	1% (3)
	1% (1)	1% (1)	1% (2)	2% (4)	1% (1)	2% (5)
	5% (10)	3% (3)	4% (13)	5% (13)	4% (4)	5% (17)
Marital Status						
Married/defacto				88%	90%	89%
				(213)	(90)	(303)
Divorced/separated				3% (6)	1% (1)	2% (7)
Never married				10%	9% (9)	9% (32)
				(23)		
Education						
	63%	54%	60%	48%	52%	49%

Secondary/Trade	(86)	(32)	(118)	(61)	(29)	(90)
Professional	37%	46%	40%	52%	52%	52%
Qual.	(50)	(27)	(77)	(65)	(29)	(94)
Annual family						
income				80%	59%	74%
≤NZ\$70000				(192)	(59)	(251)
> NZ\$70000				20%	41%	26%
Employment	92%	93%	92%	(49)	(41)	(90)
Employed	(170)	(74)	(244)			
Unemployed	8% (14)	8% (6)	8% (20)	57%	60%	58%
				(121)	(58)	(179)
				43%	40%	42%
				(92)	(39)	(131)

Note: Values are percentage (*N*) except for age where values are mean (*SD*)

Participant Characteristics

Depression and anxiety. Means for depression and anxiety levels are presented in Table 12. Most fathers experienced only low levels of depressive symptoms ($M = 3.08$, $SD = 3.66$) and anxiety ($M = 4.89$, $SD = 3.6$) at T1 (Table 12). Fathers had low total HADS scores at T1 ($M = 7.98$, $SD = 6.40$). Fathers also experienced low levels of anxiety and depressive symptoms at T2 ($M_{tot} = 5.63$, $SD = 4.72$; $M_{depr} = 2.27$, $SD = 2.49$; $M_{anx} = 3.36$, $SD = 2.76$). Mothers experienced mild levels of depressive symptoms and anxiety at T1 ($M_{tot} = 10.36$, $SD = 6.42$; $M_{dep} = 10.37$, $SD = 6.42$; $M_{anx} = 6.04$, $SD = 3.70$) and T2 ($M_{tot} = 7.45$, $SD = 6.01$; $M_{dep} = 2.92$, $SD = 2.98$; $M_{anx} = 4.53$, $SD = 3.61$). Mothers' total HADS scores differed significantly from fathers' with mothers experiencing more total distress than fathers at all times (see Table 12).

Parenting stress. Fathers experienced low- to- moderate levels of parenting stress at T2 ($M = 61.22$; $SD = 16.35$). Based on their self-reports, 6.4% of fathers compared to 10.6% of mothers experienced parenting stress levels at/over the clinical cut-off of 90. Mothers experienced similar levels of parenting stress than fathers ($M = 64.12$, $SD = 18.1$; $U = 36229.50$, $p = .092$).

Table 12

Study 4: Participant Characteristics Across Gender

Variable	Fathers (F)				Mothers (M)				
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Z T1/T2</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Z T1/T2</i>	<i>U F/M</i>
Depression									
T1	261	3.08	3.66	-	293	10.37	6.42	-	28207.50***
T2	262	2.27	2.49	3.68***	309	2.92	2.98	6.26***	35333.50**
Anxiety									
T1	261	4.89	3.59	-	293	6.04	3.70	-	30852.50***
T2	262	3.36	2.76	7.01***	309	4.53	3.61	6.87***	33457.50***
D/A Total									
T1	261	7.98	6.40	-	293	10.37	6.42	-	28785.00***
T2	262	5.63	4.73	6.38***	309	7.45	6.01	7.30***	33715.00**
Parenting									
Stress	258	61.2	16.3	-	306	64.1	18.1	-	36229.50

Note: D/A = Depression/Anxiety; *Z T1/T2* = Wilcoxon Signed-Ranks test comparing assessment point 1 and 2; *U F/M* = Whitney-Mann test comparing fathers and mothers. * $p < .05$, ** $p < .01$, *** $p < .001$.

Child functioning. Infants had a mean MDI of 90.48 ($SD = 13.40$) and yielded a mean of 93.46 ($SD = 13.31$) on the PDI. Infant scores ranged between 50 and 120 on the MDI ($N = 279$) and for the PDI between 61 and 128 ($N = 281$). Of all infants, 50.5% ($n = 141$) can be classified as having a mild cognitive delay (1SD below norm) and 9.3% ($n = 26$) as severely delayed (2SD below norm). Regarding physical functioning, 44.1% ($n = 124$) of the sample showed a mild physical delay and 11.4% ($n = 32$) a severe physical delay. Infants achieved a mean score of 0.87 ($SD = 1.25$) on the emotional and behaviour ratings.

Research Question 1: Fathers Depression Levels Postpartum vs. Two Years Later

Fathers experienced significantly more depressive symptoms at T1 than T2 ($Z = -3.68$, $p < .001$). Fathers also reported significantly higher anxiety ($Z = -7.01$, $p < .001$) and total distress levels ($Z = -6.38$, $p < .001$) at T1 compared to T2.

Research Question 2: Relationship Between Depression/Anxiety and Child

Functioning in Fathers and Mothers

Paternal depression at T1 was not associated with lower cognitive ($r_s = -.05$, $p = .457$), physical ($r_s = .01$, $p = .885$) or emotional/behavioural ($r_s = -.01$, $p = .853$) child functioning at two years (see Table 13). Paternal depression at T2 was also not associated with cognitive ($r_s = -.02$, $p = .795$), physical ($r_s = .10$, $p = .144$) or emotional/behavioural child functioning ($r_s = .06$, $p = .386$). The same pattern was found for paternal anxiety: anxiety at T1 and T2 was not related to infant's cognitive ($r_{s\ T1} = -.12$, $p = .074$; $r_{s\ T2} = -.08$, $p = .201$), physical ($r_{s\ T1} = -.06$, $p = .340$; $r_{s\ T2} = .03$, $p = .227$) or emotional/behavioural functioning ($r_{s\ T1} = -.03$, $p = .622$; $r_{s\ T2} = .03$, $p = .630$). When considering only infants with a developmental delay of at least 1SD or 2SD below the norm on the MDI or PDI, paternal mental health was only found to be correlated with child physical functioning at T2 if the child had a mild physical delay ($r_{s\ T2} = .26$, $p = .035$; Table 14).

When considering mothers it was found that, similarly to fathers, at T1 mothers experienced significantly higher levels of depressive symptoms ($Z = -6.26$, $p < .001$), anxiety ($Z = -6.87$, $p < .001$) and total distress ($Z = -7.30$, $p < .001$) than at T2. Maternal depression was not associated with child cognitive functioning at neither assessment point ($r_{s\ T1} = .02$, $p = .759$; $r_{s\ T2} = -.03$, $p = .594$), child physical functioning ($r_{s\ T1} = .05$, $p = .417$; $r_{s\ T2} = -.001$, p

= .983) or emotional/behavioural functioning ($r_{s\ T1} = -.03, p = .674; r_{s\ T2} = -.01, p = .890$). As in the case for fathers, maternal anxiety was not significantly correlated with child cognitive ($r_{s\ T1} = -.10, p = .130; r_{s\ T2} = -.06, p = .368$), physical ($r_{s\ T1} = .02, p = .706; r_{s\ T2} = .03, p = .587$) or emotional/behavioural functioning ($r_{s\ T1} = -.003, p = .959; r_{s\ T2} = -.09, p = .143$). When considering only infants with a developmental delay of at least *1SD* or *2SD* below the norm, maternal mental health was not correlated with child functioning (see Table 14).

Table 13

Study 4: Correlations Between Study Variables for Fathers and Mothers

	1	2	3	4	5	6	7	8	9	10
1. D T1	-	.33***	.62***	.33***	.87***	.36***	.21**	.02	.05	-.03
2. D T2	.37***	-	.38***	.63***	.39***	.85***	.53***	-.03	-.001	.01
3. A T1	.63***	.32***	-	.52***	.92***	.50***	.29***	-.10	.02	-.003
4. A T2	.38***	.56***	.54***	-	.48***	.94***	.48***	-.06	.03	-.09
5. D/A Total T1	.85***	.37***	.94***	.54***	-	.48***	.28***	-.05	.03	-.02
6. D/A Total T2	.41***	.82***	.51***	.91***	.51***	-	.54***	-.04	.03	-.06
7. PS	.35***	.49***	.35***	.49***	.39***	.55***	-	-.07	.01	-.06
8. MDI	-.05	-.02	-.12	-.12	-.11	-.07	-.03	-	.50***	-.22***
9. PDI	.01	.10	-.06	.02	-.05	.06	.03	-	-	-.26***
10. EB	-.01	.06	-.03	.02	-.04	.03	.02	-	-	-

Note: D = Depression, A = Anxiety, PS = Parenting Stress, MDI = Mental Development Index, PDI = Psychomotor Development Index, EB =

Emotional/Behavioural Scale; scores for father below the diagonal, scores for mothers above. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 14

Spearman Correlations Between Parental Mental Health and Child Functioning Including Children With a Score of 1SD or 2SD Under the Norm

	Fathers		Mothers	
	D/A Total T1	D/A Total T2	D/A Total T1	D/A Total T2
MDI	-.11	-.07	-.05	-.04
PDI	-.05	.06	.03	.03
MDI-1SD	-.02	-.12	-.02	.04
PDI-1SD	.10	.26*	.04	.10
MDI-2SD	-.21	-.33	-.29	-.29
PDI-2SD	.27	.26	.38	.13

Note: D/A Total = Depression/Anxiety Total Score; T1 = Assessment point 1, T2 =

Assessment point 2; MDI-1SD/PDI-1SD = MDI/PDI < 1SD; MDI-2SD/PDI-2SD = MDI/PDI < 2SD. * $p < .05$, ** $p < .01$, *** $p < .001$.

Research Question 3: Association Between Parenting Stress and Depression/Anxiety and/or Child Functioning in Fathers and Mothers

As shown in Table 13, a significant positive correlation emerged between paternal depressive symptoms and parenting stress at T1 ($r_s = .35, p < .001$) and T2 ($r_s = .49, p < .001$), paternal anxiety and parenting stress at T1 ($r_s = .35, p < .001$) and T2 ($r_s = .47, p < .001$), as well as total HADS scores and stress at T1 ($r_s = .39, p < .001$) and T2 ($r_s = .55, p < .001$). Paternal parenting stress was not related to infants' cognitive ($r_s = -.03, p = .646$), physical ($r_s = .03, p = .684$) or emotional/behavioural ($r_s = .02, p = .716$) functioning.

When examining the relationship between maternal depression, parenting stress and child functioning a similar pattern emerged for mothers in comparison to fathers. Higher maternal depressive symptoms, maternal anxiety and total scores at T1 were positively correlated with parenting stress (depression: $r_s = .21, p < .01$; anxiety: $r_s = .29, p < .001$; total: $r_s = .28, p < .001$). The correlations amongst the variables were even stronger at T2 (depression: $r_s = .53, p < .001$; anxiety: $r_s = .48, p < .001$; total: $r_s = .54, p < .001$).

Discussion

Most fathers reported low levels of depression and anxiety after their child's birth; fathers' levels of distress decreased further two years after the child's birth. No relationship between paternal depression or anxiety and the infant's cognitive, physical or emotional/behavioural functioning could be identified. Higher psychological distress was associated with higher parenting stress levels; however, parenting stress was not associated with any of the child outcomes domains. In comparison to fathers, mothers experienced significantly higher levels of depression and anxiety at all times. Similarly to fathers, mothers with higher depression levels reported experiencing more parenting stress. Parenting stress levels were similar across parents. Neither maternal stress, nor mental health was related to child functioning.

The first research question examining whether fathers' levels of distress were the highest in the first month following their child's birth was affirmed by this study. This is in accordance with the longitudinal study on parental depression conducted by Davé et al. (2010). As for fathers, mother's levels of depression and anxiety were highest after birth and their mental well-being improved over the first two years. One could argue that the time after birth is not only a period of elevated distress for mothers but also for fathers. However, it should be noted that even though parents experienced higher levels of depression and anxiety postpartum, their distress levels in this study were not within the clinical range at any time indicating that most fathers and mothers reported being mentally well. This is contrary to generally held assumptions that parents of NICU born infants experience more distress (e.g., Singer et al., 1999).

Contrary to the AB model, which guides as a framework for this thesis, neither paternal depression, nor anxiety was directly related to cognitive, physical or behavioural/emotional child functioning. Despite mothers reporting higher anxiety and depression levels these were also not associated with lower cognitive, physical or emotional/behavioural child functioning. It needs to be considered that on average neither paternal depression/ anxiety scores, nor the child functioning scores were within the clinical range. Infants with severe disabilities, who could not be tested with the BSID were not included in the data analysis. It could be argued that the results might have been different, if the infants, who were most severely impaired, were included as this could have affected the parents more. In addition, higher levels of anxiety and depression in a parent may have affected the infant differently. Nevertheless, the findings of the present study are in accordance with results from Mackley et al.'s study examining depression and stress in fathers of preterm infants: their results also showed that paternal depression scores were not related to the child's health or development (Mackley, Locke, Spear, & Joseph, 2010). It is perhaps surprising that paternal depression with its common symptoms of anger, withdrawal, alcohol abuse and others did not seem to have a significant impact on their infants. However, this study only examined the direct relationship between depression and child functioning. It can be questioned whether an indirect path exists between the two variables, such as through parenting behaviour or marital satisfaction as suggested in the AB model of thesis. Further research is needed to examine this relationship in more detail.

Fathers in the present study experienced low to moderate levels of parenting stress and fathers who yielded higher depression scores reported more parenting stress. The results reported in this study are in accordance with Belsky's model of parenting outlined in chapter 3. Belsky (1984) suggested that parent's mental health might have a significant impact on the quality of parenting. Mothers reported similar levels of parenting stress than fathers.

Strengths and Limitations

This study did not specifically recruit clinically depressed parents and included parents with a range of depressive symptoms. This could be seen as a strength making the sample more comparable to similar populations and covering all levels of depressive symptoms. However, unfortunately there was not a broad distribution of depressive symptoms and it is also possible that the impact of depression on children is only significant if the depression is severe, which could not be examined here. Even though a large number of NICU infants were recruited, the majority of infants were developed normally at two years corrected age. Moreover, this study only assessed a selection of variables, it cannot be ruled out that additional variables like marital satisfaction, parents' personality or social adjustment might have an impact on the relationship under investigation.

This study also has several strengths; it examined the relationship of depression and anxiety with parenting stress and child functioning in a large sample of NZ parents over two time points. Parents were selected randomly rather than selecting a convenience sample as often done by previous research investigations using NICU samples. Both parents were cohabitating and data was collected for each parent separately. This allowed for differences to be identified between postpartum mental health and fathers' health two years later and to compare this with mothers at the same time points. All children were assessed at the same age at the same time. The study measured not only emotional/behavioural but also cognitive and physical child functioning to examine their unique effects. Mothers were included in the study to enable gender role comparisons.

Implications for Future Research

The present study did not find a relationship between parental depression, parenting stress and child functioning. Future studies should examine the association under consideration in a sample of parents of developmentally impaired infants. Moreover, the relationship between paternal depression and parenting stress deserves further consideration to examine the directionality of the relationship and to review if fathers experience similar levels of parenting stress than mothers. In addition, depression might not be the only determinant of parenting stress. Gelfand et al. (1992), for example, found in their sample of mothers that even though maternal depression was the strongest predictor of stress, infant temperamental difficulty and low levels of marital harmony also predicted parenting stress. These findings suggest that several determinants might lead to parenting stress in mothers. Future research needs to examine which determinants predict parenting stress in fathers.

Conclusion

Levels of distress in fathers and mothers were significantly lower two years after the child's birth than in the postpartum period. Paternal depression and anxiety were not associated with lower cognitive, physical or emotional/behavioural child functioning. Child functioning was also not related to parenting stress. A significant relationship was revealed between paternal mental health and parenting stress with more depressed and anxious fathers experiencing more parenting stress two years after the child's birth. Mothers experienced similar levels of parenting stress than fathers but significantly higher levels of depression and anxiety than fathers. Maternal mental health was not related to child functioning. As for fathers, maternal depression and anxiety were significantly related to parenting stress. It was suggested that depression is unlikely to be the sole predictor of parenting stress. Indeed, as for parenting in general as outlined in Belsky's model (1984), there is a common agreement that

individual parental, environmental and child factors may all contribute to the development of parenting stress (Crnic & Low, 2002). Which factors contribute to fathers and mothers parenting stress in particular? Is depression the largest contributor to the experience of stress? These questions will be considered in the following chapter.

Chapter 8: Examining the Predictors of Parenting Stress in Fathers and Mothers (Study 5)

In the fifth study, which is presented in this chapter, the predictors of parenting stress as outlined in the adapted Belsky model of parenting are examined and compared for mothers and fathers.

Introduction

In chapters 6 and 7, a link between paternal depression and parenting stress was identified, but it was argued that it is likely that more factors contribute to parenting stress. Belsky's (1984) model of parenting (Figure 1, p. 44) was introduced in chapter 3, and provides an account of how parental, child and social factors are interrelated and together determine the quality of parenting. The model has also been used by researchers to study related topics such as parenting stress (Cardoso, Padilla, & Sampson, 2010). Cardoso et al. (2010) reported that the model adequately predicted parenting stress in the majority of mothers in their sample; fathers were not included.

Previous studies, including Study 3, reported inconsistent results regarding whether fathers experience less parenting stress than mothers. Some authors argued that mothers and fathers stress levels are more similar than different (e.g., Theule, Tannock, & Jenkins, 2013). This was also found in Study 4; fathers experienced similar levels of parenting stress than

mothers. Even if the stress levels are similar for fathers and mothers, the factors that contribute to parenting stress could be quite different across gender (Deater-Deckard & Scarr, 1996). Researchers have suggested that spousal factors (e.g., maternal health) are likely to be a main source of fathers' parenting stress, with child related factors (e.g., child's health) being predictive for mothers' stress (Frank et al, 1991; Hastings et al., 2005). This could be due to the mother spending more time with the child as the primary caregiver, and therefore being more affected by their child's health. Fathers, on the other hand, might rely more on their spouses, because they have to take a greater role in child care if the mother is unwell or unsupportive, which may lead to increased parenting stress. A range of parental, social and child factors that may contribute to parenting stress were suggested in the AB model in chapter 3 and will be examined in this study.

Parental Factors

Parental mental health. Belsky (1984) stated that parents' psychological well-being has an effect on their parenting attributes. Depression is the mental illness that has been studied the most in this context. Theule et al. (2013) reported in their meta-analysis that depressive symptoms were the strongest predictor for parenting stress. It is unclear whether their results apply for both parents, as no differentiation was made between mothers and fathers, so it is unclear if their results can be replicated for fathers. However, as pointed out in chapters 6 and 7, it was found in those studies that parenting stress was positively correlated with paternal depression. Researchers have also found a significant link between maternal and paternal anxiety and parenting stress (Huizink et al., 2017; Vismara et al., 2016).

Parents' personality traits. Belsky (1984) emphasised that parental personality plays an important, if not the most important, role as a predictor of parenting quality. Certain

personality traits are associated with higher parenting stress levels (e.g., neuroticism), and other traits seem to function as protective factors (i.e., emotional stability) for fathers and mothers (Rantanen, Tilleman, Metsäpelto, Kokko, & Pulkkinen, 2015; Vermaes et al., 2008). Most of the research has focused on the common personality traits extraversion and neuroticism, and less on personality traits such as self-directedness and harm avoidance. High self-directedness (SD) has been associated with high functioning generally, and the strength to cope with any situation (Celikel et al., 2009). Therefore, it can be expected that a high level of self-directedness could function as a protective factor for parenting stress. When considering harm-avoidance, it was found that individuals with high levels of harm-avoidance reported experiencing feelings of tiredness and fatigue more easily than individuals with low levels of harm-avoidance (Cloninger, Przybeck, Svrakic, & Wetzel, 1994). Heightened tiredness and fatigue might act as vulnerabilities for feeling stressed. However, it remains unclear if Cloninger et al.'s (1994) finding applies to both men and women. Harm avoidance is also highly positively correlated with neuroticism across gender (Jokela & Keltikangas-Järvinen, 2011). Neuroticism has been reported to be associated with less effective stress-coping skills in parents (Deater-Deckard, 2004) and, as aforementioned, higher parenting stress levels.

Furthermore, parental personality seems to be related to parental psychopathology, marital satisfaction and social support/adjustment. As described in previous chapters, low extraversion and high neuroticism were found to be associated with higher levels of depressive symptoms (Cox et al., 2004). Cox et al. (2004) did not report the gender of the participants, leaving it unclear if the results apply for men and women in the same way. Harm avoidance has also been found to be associated with depression. For example, Ulrich et al. (2001) reported that high harm avoidance in teenagers predicted depression in adulthood. Low extraversion and high neuroticism are also related to lower levels of marital satisfaction

in men and women (e.g., Najarpourian et al., 2012). In addition, Swickert, Hittner, and Foster (2010) reported that extraversion, neuroticism and openness predicted perceived social support in men and women. Woodworth, Belsky, and Crnic (1996) found that fathers' personality traits (extraversion and neuroticism) were linked to fathers' satisfaction with social support.

Parental bonding. Belsky (1984) argued that the experiences parents had whilst growing up may affect their personality and, in turn, personality affects their quality of parenting. It can be questioned whether this relationship also exists for parenting stress. The bond between a caregiver and a child, as well as the child's emotional attachment to their caregiver, have been investigated in this context. Some researchers found a relationship between parenting stress and bonding, with high levels of care and a low level of overprotection functioning as a protector of parenting stress (Willinger, Diendorf-Radner, Willnauer, Joergl, & Hager, 2005). However, these studies did not consider parental personality as a mediator variable as proposed by Belsky (1984). Researchers that focused on attachment found support for Belsky's suggested pathway with attachment security being related to the personality construct ego-resilience, which in turn was found to be associated with parenting behaviour (Van Bakel & Riksen-Walraven, 2002).

Social Factors

Marital satisfaction. Belsky (1984) hypothesized that low marital satisfaction could be a strong predictor of parenting stress. One domain of marital satisfaction appears to be partner support with couples who perceived their partners as being more supportive reporting higher levels of marital satisfaction (Lawrence et al., 2008). Partner support might assist in dealing with the demands of parenthood and, conversely, the lack of support may lead to an

increase in parental role stress. The research findings for the association between marital satisfaction and parenting stress are inconsistent. For example, Stoneman et al. (1989) reported that paternal parenting stress seems to be most strongly related to low levels of marital satisfaction, whereas maternal parenting stress seems to be more closely linked to child variables. Individuals who experience low rates of marital satisfaction often report low partner support (Lawrence et al., 2008). Lower perceived support might leave the parent feeling left alone with the demands of parenting, thus increasing parenting stress levels: in particular, child-rearing stress. In contrast, Theule et al. (2013) did not find a significant link between low marital satisfaction and parenting stress. No gender separation was made; however, the studies included in Theule et al.'s (2013) meta-analysis predominantly focused on mothers. As previously mentioned, marital satisfaction seems to be negatively correlated with parental psychopathology (e.g., Gabriel, Beach, & Bodemann, 2010).

Social adjustment. Social support has been widely regarded as a possible protective factor for parenting stress (Webster-Stratton, 1990), as it was found that more social support is associated with less parenting stress in fathers and mothers (Deater-Deckard, 1998). As for partner support, receiving support from individuals within their social network might reduce stress levels (Deater-Deckard, 1998). In addition, social support might have an indirect effect on parenting: social support is associated with greater parental well-being, which, as pointed out above, appears to function as a protective factor for parenting stress (Belsky, 1984; Webster-Stratton, 1990). Östberg and Hagekull (2000) emphasised that the satisfaction with social support is just as important, if not more important, than the amount of support. Social adjustment measures one's satisfaction with their social situation and their adjustment. To date, it remains unclear what impact social adjustment has on parenting stress.

Work. Belsky proposed that unemployment might negatively affect parental functioning. Researchers have found that fathers who are unemployed seem to experience higher levels of parenting stress (Nomaguchi & Johnson, 2016). The research findings are predominantly based on fathers, due to fathers often being the main economic providers and thus, unemployment may affect fathers even more than mothers. As described in previous chapters, unemployment is also significantly linked to depression in both parents (Ballard et al., 1994; Ramchandani & Psychogiou, 2009). Belsky suggested in his model of parenting that unemployment and parental personality influence each other, but it remains unclear how these are meant to be related and which personality traits he believed to be associated with unemployment.

Child Factors

Belsky (1984) also included child characteristics and child development in his model of parenting; child functioning was considered in the adapted Belsky model of this thesis as the child factor. Amongst others, previous studies have identified a relationship between child behavioural problems and parenting stress (e.g., Meppelder et al., 2015). Belsky suggested that any characteristic of a child that is assumed to “make them more or less difficult to care for” (Belsky, 1984, p. 86) is likely to have an impact on parenting aspects, such as parenting stress. Preterm born infants or any infant born in the neonatal intensive care unit (NICU) are often more demanding and require extra care compared to healthy- term infants, thus it may make them more difficult to care for (Howe, Sheu, Wang, & Hsu, 2014). NICU birth status may therefore be seen as a cluster variable presenting different factors such as poor child health, low birth weight or preterm birth. Despite the stressors associated with having an infant admitted to the NICU, the contribution of having a preterm or unwell infant to paternal parenting stress over time has not been studied in depth. Schappin and others showed in their

meta-analysis that parents of NICU children experience more parenting stress after birth than parents of no-risk children (Shappin, Wijnroks, Uniken Venema, & Jongmans, 2013). However, fathers were underrepresented in the studies included in Shappin et al.'s (2013) meta-analyses.

Limitations of Previous Studies

A significant limitation of previous studies is the very small number of fathers included in the samples under investigation, which restricts or eliminates the generalisability of their findings. Even though a large number of fathers was included in Study 4, which examined the relationship between paternal depression and parenting stress, depression was not considered as a predictor of parenting stress. Additional variables such as marital satisfaction, parental personality and social adjustment that were suggested in the AB model in chapter 3 might contribute to parenting stress, but were also not taken into consideration. Moreover, previous studies found mixed results for mothers and fathers and have not examined the effect of certain variables on parenting stress such as social adjustment.

Purpose of This Study

This study examined the levels and determinants of parenting stress in a large sample of fathers two years after the child's birth, and explored whether or not these are similar to the contributors of parenting stress in mothers. Stress was examined using the adaptation of Belsky's parenting model as outlined in chapter 3 (see Figure 5) to answer the following research questions:

1. Does the proposed model sufficiently explain the determinants of parenting stress across mothers and fathers?

2. What are the key determinants of parenting stress in fathers?
3. Do the determinants of parenting stress vary between mothers and fathers?

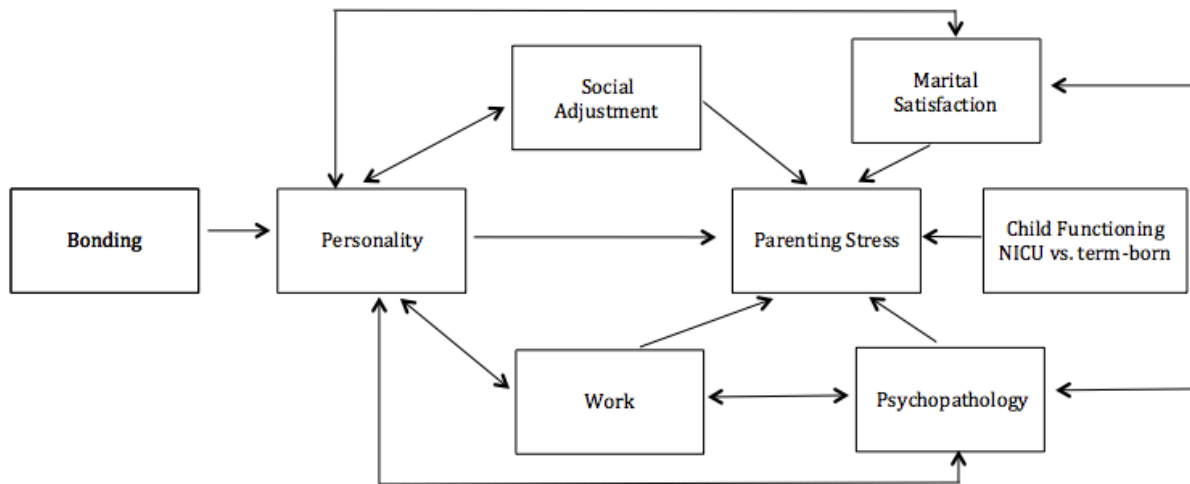


Figure 6. Study 5: AB Model for examining the predictors of parenting stress

Method

Participants

The previously collected data from the same sample as in Study 4 (chapter 7) was used in Study 4 (chapter 7) was used for this study, consisting of 242 mothers and 205 fathers of NICU born infants and 100 mothers and 89 fathers of term- born infants. The whole sample of the present study consisted of 294 cohabitating fathers and 342 mothers, and their infants. Demographic information can be found in chapter 7, Table 1 (p. 179f). Child functioning in this study was assessed as being admitted to NICU after birth vs. term-born, control infant. NICU status functioned as a cluster variable for child health, birth weight, preterm birth and others.

Procedure

As outlined in Study 4, an experienced interviewer met with each parent separately within three weeks of the infants' birth to conduct the first research assessment; the last assessment was conducted two years after the child's birth. The assessments consisted of a clinical interview and a set of self-report questionnaires. For this study, self-reports and data from the last assessment at two years was utilised, unless otherwise specified. The following questionnaires were used in this study: the PSI, HADS, DAS, Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979), the short form of the Temperament and Character Inventory (TCI, Cloninger, Przybeck, Svrakic, & Wetzel, 1994), and the Social Adjustment Scale-Self-Report (SAS; Weissman & Bothwell, 1976). For all questionnaires only total scores were considered to simplify the model, with an exception of the PBI and the TCI, where subscales were appropriate for the purpose of this study. The PBI does not offer a total score. Only the subscales self-directedness (SD) and harm avoidance (HA) were used from the TCI, as it was proposed that these are most likely to have an impact on parenting stress (see introduction). Some of the questionnaires have previously been described in Chapter 5 / Chapter 7 (DAS, PSI, HADS); thus, only the additional questionnaires listed above will be outlined below.

Parental bonding. The Parental Bonding Instrument (PBI; Parker et al., 1979) assesses retrospectively how the parents experienced their own upbringing during their first 16 years of life. The PBI consists of two scales, care and overprotection, which are assessed for both mothers and fathers. According to Parker et al. (1979) the care scale ranges from care and empathy to indifference and rejection. The overprotection scale covers encouragement of independence and autonomy on the one hand, and intrusion and encouragement of dependency at the other end of the scale.

The participants rated their own parents' attitudes and behaviour in the past on 25 items as "very like", "moderately like", "moderately unlike" or "very unlike". An example statement would be: "Seemed emotionally cold to me". Parental bonding was assessed at the first assessment post birth. The reliability and validity of the PBI across different studies has been described as satisfactory (Parker, 1989). A more recent study reported good reliability scores ranging from .87 to .94 across the scales (Safford, Alloy, & Pieracci, 2007). Wilhelm, Heather, Parker, and Hadzi-Pavlovic (2005) reported that the PBI showed acceptable re-test stability over a 20 year period.

Parental personality. The short form of the Temperament and Character Inventory (TCI-144; Cloninger et al., 1994) was used to assess fathers and mothers' personality traits. The TCI-144 measures temperament and character dimensions on 144 true/false items, such as "I often feel that I am the victim of circumstances". Higher scores reflect higher pathology. Eight dimensions are covered on the subscales, but only the following two were included in the study as they were considered as probably the most important ones for parenting aspects: harm avoidance (HA) and self-directedness (SD). Harm avoidance refers to the individual's tendency to avoid aversive stimuli. Self-directedness describes the self-determination of the individual (De Fruyt et al., 2000). The TCI was administered at the first assessment post birth. The long form of the TCI has shown to have good psychometric properties (Brändström et al., 1995; Cloninger, Svrakic, & Przybeck, 1997) with Cronbach's alpha estimated at .81 for SD and .85 for HA (Brändström et al., 1995). Less research has been done to test the English short forms; however, the results for translated versions show that the reliability and internal consistency were acceptable (Vespa et al., 2015; Zohar & Cloninger, 2011).

Social adjustment. The Social Adjustment Scale-Self-Report (SAS; Weissman & Bothwell, 1976) measures social functioning and satisfaction over the last two weeks. The 45

items can be assigned to six major areas of functioning (e.g., parental or social functioning), and a total score which reflects overall social functioning. An example item would be, “Did you depend on your relatives for help, advice, money, or friendship during the last 2 weeks?” The total score was used in the present study. Higher scores reflect more impairment and less satisfaction. All items are designed using a 5-point Likert scale ranging from *not at all* to *all the time* and vice versa. Suzuki et al. (2003) reported that the scale obtained good reliability scores ($\alpha = .73$) and satisfactory construct validity.

Work. Two years after the child’s birth, participants were asked whether they were currently employed (yes/no).

Child functioning. The child variable was based on the child’s admission status after birth, and was measured as admitted to the NICU after birth ($n = 242$) versus control group (full-term healthy infant, no NICU admission required, $n = 100$).

Data Analyses

As in study 4, participants were combined into one group, due to the absence of significant differences between parents of the NICU and parents of the control group. Thus, all parental self-reports were examined without differentiating between NICU parents and control parents. However, one exception had to be made in this study: the child variable, which was defined as admission status NICU born vs. control.

The data analysis was divided into two parts. In part one, descriptive statistics (mean scores, standard deviations) were calculated for both mothers and fathers on all variables using SPSS 22 (IBM Corp., 2013). Mann-Whitney U tests were used to explore any significant differences between the two groups. In part two, path analysis was used to test the

model fit for parenting stress across parents using Mplus 7.11 (Muthén & Muthén, 1998-2013). Personality, psychopathology, marital satisfaction, social adjustment and the child's admission status were entered as observational variables predicting parenting stress. Bonding was added to the model as a predictor of personality. Interrelationships between parental and social variables were also considered in the model and calculated using Spearman's *rho* (Figure 2). Model goodness of fit across parents was assessed based on a number of indices, including: (a) the model chi square goodness of fit statistic (χ^2). To indicate a good fit, χ^2 must be low compared to the degrees of freedom and *p* not significant (Hooper, Coughlan, & Mullen, 2008); (b) the Root Mean Squared Error of Approximation (RMSEA). Values of RMSEA less than 0.06 are assumed to be indicative of a well-fitting model; (c) the Standardized Root Squared Residual (SRMR), which considers a model as well-fitting if the value is less than .08; and (d) the Comparative Fit Index (CFI). This index varies between 0 and 1 with values close to 1 indicating a well-fitting model (Hu & Bentler, 1999).

Given that infants were nested within families, tests had to be conducted to examine the extent to which intra-familial factors impacted upon the estimated model parameters for the associations, the predictors and the measure of parenting stress (which could not be tested using the MPlus Path Analysis (Muthen, 2017, personal communication)), the model described above was re-fitted using ordinary least squares mixed effects regression. In this model, within-family factors were accounted for by fitting individual slope and intercept terms for each family, with a Wald chi-square test of significance for the extent to which these factors added to the overall variance of the model.

Results

Participant Characteristics

Participant characteristics and gender differences are presented in Table 15. As described in Study 4, fathers experienced low-to-moderate levels of parenting stress ($M = 61.22$; $SD = 16.35$) and low levels of anxiety and depressive symptoms ($M = 5.63$; $SD = 4.72$). Fathers reported high levels of marital satisfaction ($M = 117.94$, $SD = 13.42$). Only 7.6% of fathers ($n = 20$) reported being unemployed two years after their child's birth.

Compared to mothers, fathers experienced lower levels of anxiety and depression (total score: $U = 33833.00$, $p = .001$), and lower levels of harm avoidance ($U = 23203.00$, $p < .001$). Considering unemployment, the numbers were higher for mothers, with 42% of mothers ($n = 131$) reporting to be unemployed. No significant gender differences were identified for the remaining variables.

Table 15

Study 5: Participant Characteristics Across Gender

	Fathers			Mothers			
	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>U</i>
Parenting Stress	258	61.22	16.35	306	64.12	18.06	36229.50
Bonding							
Maternal Care	255	28.25	7.02	290	26.55	8.94	34090.00
Materna Protection	255	11.92	6.81	290	12.61	8.29	36204.50
Paternal Care	242	23.59	8.22	275	24.34	8.88	30954.50
Paternal Protection	242	10.43	6.50	275	11.46	7.45	31100.50
Personality							
Self-directedness	263	16.33	3.70	295	16.31	3.82	38281.00
Harm-avoidance	263	5.88	3.87	295	9.13	4.58	23203.00***
Psychopathology	263	5.88	3.87	295	9.13	4.58	33833.00**
Social Adjustment	265	1.72	0.25	312	1.71	0.27	38733.00
Marital Satisfaction	242	117.94	13.42	251	116.63	16.24	30136.00

Note: SD = self-directedness; HA = harm avoidance; MC/PC = maternal/paternal care;

MP/PP = maternal/paternal protection. * $p < .05$, ** $p < .01$, *** $p < .001$

Correlations Between All Variables

All variables were significantly correlated across gender (see Table 16). Aside from intercorrelations between the PBI variables, the strongest correlation for fathers was found between parental psychopathology and parenting stress and social adjustment, and marital satisfaction and social adjustment (all $r_s = .53$, $p < .001$). For mothers, the strongest correlation was found between psychopathology and social adjustment ($r_s = .57$, $p < .001$).

Table 16

Study 5: Spearman Correlations Between Study Variables for Fathers and Mothers

	1	2a	2b	2c	2d	3a	3b	4	5	6	7	8
1 Parenting Stress	-	-.16**	.21***	-.17**	.26***	-.26***	.22***	.54***	.47***	-.39***	-.11*	-.01
2a Bonding – MC	-.14*	-	-.56***	.41***	-.41***	.22***	-.19**	-.20**	-.21**	.16*	.01	.001
2b Bonding – MP	.08	-.52***	-	-.28***	.55***	-.25***	.18**	.21**	.22***	-.23**	.02	.03
2c Bonding – PC	-.13	.49***	-.33***	-	-.51***	.06	.02	-.17**	-.20**	.11	.02	-.04
2d Bonding – PP	.16*	-.34***	.62***	-.48***	-	-.09	.11	.21**	.17**	-.16*	-.05	.05
3a Personality – SD	-.36***	.27***	-.23***	.18**	-.20**	-	-.42***	-.30***	-.27***	.21**	.22***	-.01
3b Personality – HA	.27***	-.11	.12*	-.19**	.15*	-.33***	-	.26***	.29***	-.22**	-.14*	.08
4 Psychopathology	.53***	-.26***	.12	-.21**	.16*	-.33***	.25***	-	.57***	-.41***	-.06	.02
5 Social Adjustment	.43***	-.30***	.13*	-.22**	.16*	-.33***	.20**	.53***	-	-.48***	-.07	-.02
6 Marital Satisfaction	-.46***	.15*	-.05	.15*	-.11	-.32***	-.21**	-.51***	-.53***	-	-.05	-.13*
7 Work	-.20**	.15*	.06	.12	-.05	.13*	-.10	-.23***	-.15*	.05	-	.03
8 Child Variable	-.02	-.02	-.03	-.01	.01	.10	-.09	-.06	.02	.02	.002	-

Note: Fathers scores are below the diagonal, mothers above. * $p < .05$, ** $p < .01$, *** $p < .001$

Research Question 1: Testing the Model Fit for Parenting Stress Across Parents

The first test of the model revealed that the data from the PBI neither functioned consistently as a predictor of personality as proposed in Belsky's model (see Table 17), nor added significantly to the model, so the PBI data was removed from further analyses.

Table 17

Study 5: Bonding Subscales as a Predictor (B) of SD and HA in Fathers and Mothers

	Fathers		Mothers	
	SD	HA	SD	HA
MC	.12	-.07	.14*	-.08
MP	-.11	.14*	-.13	.15*
PC	.02	-.04	.02	-.04
PP	.01	-.02	.01	-.02

* $p < .05$, ** $p < .01$, *** $p < .001$

The model analyses indicated the addition of two further correlations: parental psychopathology with social adjustment, and marital satisfaction with social adjustment; these were included. The model fit indices can be found in Table 18. All fit indices showed a very good fit of the model across fathers and mothers. The model (Figure 6) explained 29% of the variance in parenting stress for fathers ($R^2 = .291, p < .001$) and 38% of the variance for mothers ($R^2 = .378, p < .001$).

Table 18

Study 5: Parenting Stress Model Fit Indices Across Parents

Test	Results
Chi-Square Test of Model Fit	
χ^2	18.91
df	19
p	.46
Chi-Square Contribution from Each Group	
	10.44 (fathers)
	8.47 (mothers)
RMSEA estimate	0.00
CFI	1.00
SRMR value	.04

Note: χ^2 = Test of equivalence across gender

Research Question 2: Determinants of Parenting Stress in Fathers

Psychopathology, social support, marital satisfaction and work were significant predictors of fathers' parenting stress. Fathers' mental health was the strongest predictor of parenting stress ($B = 0.248, p < .001$). No effects could be found for self-directedness, harm avoidance or the child variable (see Table 19, Figure 6).

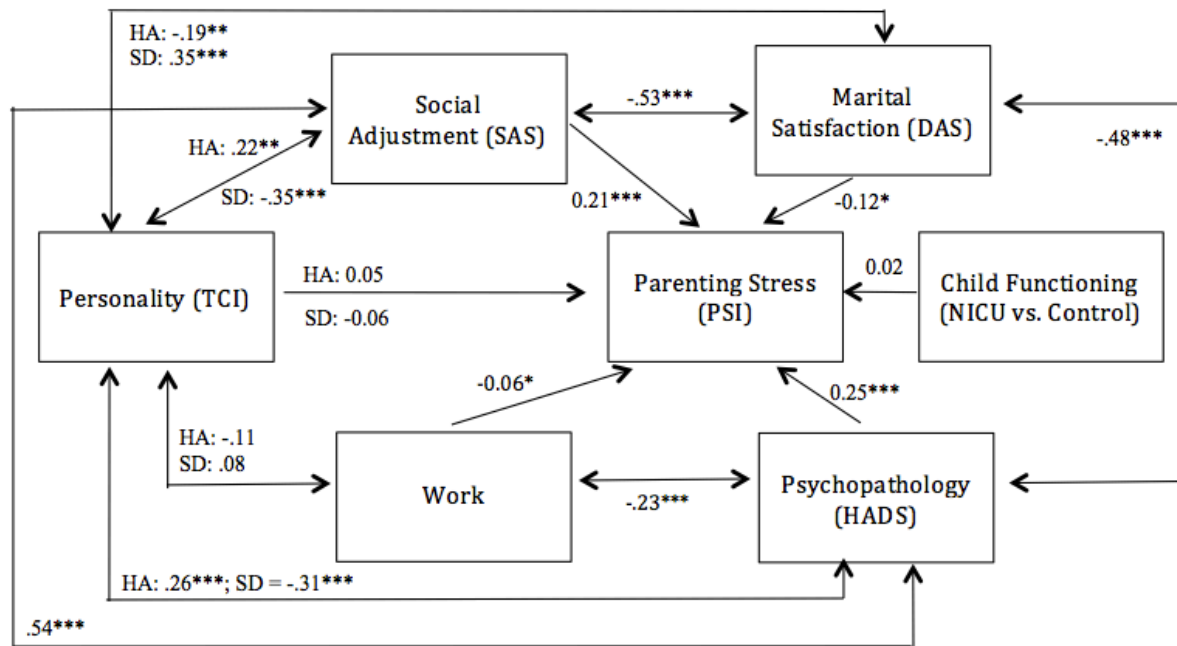


Figure 7. Study 5: New parenting stress model presenting paternal results.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Research Question 3: Gender Role Differences in the Determinants of Parenting Stress

Similar results were found for fathers and mothers (Table 19). Psychopathology, social adjustment, marital satisfaction and work predicted maternal parenting stress. Similarly to fathers, mothers' mental health was also the strongest predictor of parenting stress ($B = 0.31$, $p < .001$) and the infants' admission status (NICU vs. control) did not appear to contribute to parenting stress two years after birth for mothers either ($B = 0.002$, $p = .961$).

Table 19

Study 5: Predictors (B) of Parenting Stress in Fathers and Mothers

	Fathers	Mothers
Personality - SD	-0.06	-0.05
Personality - HA	0.05	0.05
Psychopathology	0.25***	0.31***
Social Adjustment	0.21***	0.20***
Marital Satisfaction	-0.12*	-0.13*
Work	-0.06*	-0.10*
Child Variable (NICU vs. control)	0.002	0.002

* $p < .05$, ** $p < .01$, *** $p < .001$

Test of within-family variance. As noted in the method, it was not possible to account for the extent to which intra-familial factors may have impacted on the estimated model parameters using the procedure described above (Muthen, 2017, personal communication). In order to examine this issue, the model described above was re-fitted in an ordinary least squares mixed effects model framework using Stata 14 (StataCorp, 2015). The results of this analysis suggested that intra-familial factors did not contribute significantly to the variance accounted for by the model (Wald chi-square (3) = 4.32, $p = .12$), suggesting that the parameter estimates shown above were not unduly influenced by intra-familial factors.

Discussion

In this study an adaptation of Belsky's (1984) model of parenting was used to examine predictors of parenting stress in fathers and mothers of infants admitted to the NICU after

birth, and parents of term-born infants. The model omitting the PBI showed a very good fit for the prediction of parenting stress in fathers and mothers two years after birth. The determinants of maternal and paternal parenting stress were psychopathology, social adjustment, marital satisfaction and work.

The strongest predictor of paternal parenting stress levels was the fathers' mental health; higher anxiety and depression scores were associated with more parenting stress. This finding provides empirical support for the AB model proposed in this thesis. There is little comparable research, and previous studies, that have considered depression in fathers as a predictor for paternal stress, have reported mixed results. As outlined in Study 3, some authors demonstrated that paternal depression functions as a predictor of parenting stress (Ozturk et al., 2014; Saisto et al., 2008). However, others reported that paternal depression was not a significant predictor of parenting stress (Giallo et al., 2015; Seah & Morwaska, 2016). The finding of the current study however, is comparable to the previous studies findings for mothers, where maternal depression was shown to be the strongest predictor for mothers' stress (Leigh & Milgrom, 2008). Parents experiencing mental health problems might have fewer resources to handle the demands of parenthood, and experience higher parental role stress.

Deater-Deckard and Scarr (1996) noted that marital dissatisfaction was the strongest predictor of parenting stress in mothers. Interestingly, marital satisfaction was not the strongest predictor for fathers in the present study, but it did significantly add to parenting stress. Consistent with previous research investigations (e.g., Liu & Wang, 2015; Stoneman et al., 1989), lower levels of marital satisfaction were associated with higher parenting stress levels in this study.

The majority of studies that have investigated the quantitative aspect of social support have shown that less support predicts higher levels of parenting stress (Cardoso et al., 2010). In contrast, the present study focused on a qualitative aspect – the satisfaction with and adjustment to one's social situation, and found that lower satisfaction/more impaired adjustment predicts parenting stress in fathers. Webster-Stratton (1990) emphasised that parental satisfaction with the social support is essential, in order for it to function as a protective factor for parenting stress.

Contrary to expectations, lower levels of self-directedness were not associated with higher levels of parenting stress in the present study. Individuals showing low levels of self-directedness have been described as aimless, inept and undisciplined (Cloninger & Svrakic, 1997). These character traits were expected to lead to an increase in parenting stress in fathers and mothers with low self-directedness. Despite a significant gender difference in the baseline level of harm avoidance, with mothers reporting more harm-avoidance, this variable did not contribute to parenting stress in mothers or fathers. The inclusion of a variety of significant contributors of parenting stress might have affected the impact of the personality variables tested here on parenting stress.

Belsky (1984) proposed that parents' own developmental history can contribute to parenting stress via personality. Bonding, measured as care and overprotection, did not have an effect on parents' personality or parenting stress in the present study. This study differed from other studies, as it measured bonding instead of attachment and therefore did not divide parents into different attachment style groups but included total scores of care and overprotection as a continuous variable. It may be that only certain attachment styles predict parenting stress, which could not be examined due to the measurement approach used.

Schappin and others showed in their meta-analysis that parents of NICU children experience slightly more parenting stress than parents of no-risk children due to the medical concerns or conditions, such as low birth weight or illness, that initiated the NICU admission in the first place (Schappin et al., 2013). However, this result only reflected parenting stress within the NICU stay. The authors reported that due to insufficient numbers of fathers, analyses at a later stage could not be conducted. Given that the clear majority of participants were parents of NICU infants, a similar pattern was expected in the present study; however, the infants' admission status (i.e., NICU status vs. control) did not contribute to parenting stress two years after the infant's birth. Rather, only parental and social factors were related to parenting stress. Surprisingly, two years after birth, it does not seem to matter anymore whether a child was a high-risk infant at birth and admitted to the NICU or not. Increased stress levels, in the time after birth, in parents whose child was admitted to the NICU might be explained due to the increased uncertainty and care needed. As the need for care decreases over time, and/or parents become more confident, stress levels may decrease. Some researchers have suggested that the degree to which parents are affected by having an infant born in the NICU, depends upon the baby's medical risk status, age and developmental outcome (e.g., Singer et al., 1999; Taylor, Klein, Minich, & Hack, 2001). Even though all mothers of NICU infants in Singer et al.'s study (1999) had elevated levels of parenting stress one month after birth, only mothers of high-risk infants (very low birth weight and/or illness) continued to experience higher stress levels throughout the years after birth. This may be due to these infants requiring more care, being more likely to need on-going treatment, and possessing a higher risk for morbidity, which can increase parenting stress. Fathers were not included in Singer et al.'s (1999) study. The infants' health and prematurity level may be determinants of stress at birth; in the long term the child's developmental outcomes are what make a child more, or less, difficult to care for over the years. Future studies should therefore

consider children's development over time and its impact on paternal parenting stress, rather than solely focusing on the age or medical status of the infant at birth.

In order to address this study's final research question, mothers and fathers' results were compared to identify any potential differences. As outlined in Study 4, fathers experienced similar levels of parenting stress, but lower levels of anxiety and depressive symptoms than mothers. Consistent with previous research (Miettunen, Veijola, Lauronen, Kontojärvi, & Joukamaa, 2007), mothers reported significantly more harm avoidance than fathers. The predictors of parenting stress were the same for mothers and fathers and, despite explaining a slightly larger amount of variance in parenting stress for mothers, the proposed adapted Belsky model fit well for both parents.

Strengths and Limitations

The present study has limitations. The cross-sectional nature of the data limits the extents to which causal conclusions may be drawn. Also, the present study is based on self-report measures and, while a number of variables were examined, there is still a significant amount of variance that could not be explained, suggesting the examination of other variables is needed. For example, Van Bakel and Riksen-Walraven (2002) suggested that parental education and intelligence should be added to Belsky's (1984) model. Furthermore, Cardoso et al. (2010) reported that the results might vary across different ethnic groups. This was not examined, as the sample was relatively homogenous in terms of ethnicity. The present study also did not measure parents' stress levels before birth. Some authors have suggested that stress pre-birth could be a strong predictor for parenting stress post-birth, and at a later stage (Crnic & Low, 2002). In regard to the child's impact on parenting stress, only birth admission status (NICU vs. control) was considered as the child variable under investigation.

One of the strengths of this study is the inclusion of a large number of fathers, and the separate examination of maternal and paternal stress, which allowed for comparisons to be made. Previous studies had mostly failed to either involve fathers or to clarify whether their results apply for both parents. Even though some studies used Belsky's (1984) model as a theoretical foundation, very few of these statistically tested the model as comprehensively as reported here. By assessing the effects of parental personality and psychopathology separately, the individual impact on parenting stress could be studied in more depth.

Implications for Future Research

Future studies should use additional measurements, such as clinical interviews to avoid reporter bias, and should consider using gender-sensitive tools for the assessment of paternal depression. Future studies should include further assessment points of parenting stress, such as postnatal stress or parenting stress at a later stage of the child's life. Moreover, there is a need to examine further variables such as ethnicity and their impact on stress. Future studies need to examine the actual developmental status of the child as a determinant of parenting stress. Stress was only assessed when the children were two years of age (corrected age); future studies should consider measuring stress at different stages ante-natally, and during the child's life.

Conclusion

Overall, the results of the current study, examining parenting stress during infancy and early childhood, largely supported Belsky's (1984) model of parenting for the, The model tested in the present study explained a significant amount of parenting stress in fathers and mothers. Parenting stress was predicted by paternal psychopathology, social adjustment,

marital satisfaction and work for both parents. Child ‘functioning’ measured as admitted to NICU after birth vs. healthy-term-born infant, did not predict parenting stress in parents two years after the birth of the child. It was argued that the actual developmental status of the child needs to be considered when examining child functioning as a predictor of stress, as not all children admitted to the NICU after birth show persistent health issues, and only mothers of children who were classified as “high-risk” seem to show higher parenting stress levels (Singer et al., 1999). It remains unclear if these results also apply to fathers. More research is needed to examine whether the finding that parenting stress levels are only high in parents of children who show poor functioning can be confirmed, and whether the results also apply for fathers; this is examined in Study 6 (chapter 9).

Chapter 9: Examining the Impact of Child Functioning on Parenting Stress (Study 6)

In this chapter, a study on the impact of cognitive and physical child functioning on fathers and mothers' parenting stress is presented. The adapted Belsky model is re-tested to determine whether including the infant's cognitive and physical functioning at age two years has an impact on parenting stress, as well as on depression and anxiety, parental personality, marital satisfaction, social adjustment and work.

Introduction

Belsky (1984) suggested in his model of parenting that the contribution of parental, social and child factors should be considered when assessing parenting-related topics, such as parenting stress. In Study 5 (chapter 8), parental anxiety and depression levels, lower marital satisfaction and social adjustment, and work status were shown to predict parenting stress in fathers and mothers. Belsky (1984) proposed that children's characteristics and their developmental status also contribute to parenting stress. It was suggested that parents of NICU infants may experience higher levels of parenting stress due to the stressful experience of having an infant admitted to the NICU, the uncertainty about their infant's health and future development, and the higher level of care and need for ongoing treatment for those infants. However, the infants' admission status at birth (NICU vs. term-born) was not a predictor of paternal parenting stress two years post birth in Study 5. Previous studies showed mixed results as to whether NICU parents experience higher levels of parenting stress over

time, with some researchers do reporting that NICU parents experience higher levels of parenting stress and others reporting that stress levels are similar in NICU and control parents (e.g., Shappin et al., 2013; Treyvaud et al., 2011). One potential explanation for the different results across previous studies was that NICU status alone might not increase parenting stress. Instead, the infant's health and development over time may be an important predictor of parenting stress, as this could determine whether the child requires additional care, or whether it may be perceived as more challenging.

Tervo (2012) reported that children's delay on fine motoric functioning predicted parenting stress. The more severe the delay, the higher the experienced stress levels (Tervo, 2012). Webster et al. (2008) also found that children's motor functioning is a significant determinant of parenting stress. No differentiation was made between mothers and fathers in either of the studies; both were predominantly based on mothers. Another criticism of Tervo's (2012) study is that child developmental functioning was assessed via self-reports, and not through an in-depth assessment by a trained, non-biased clinician. Children born prematurely do not only show poorer physical outcomes, as highlighted above, but also show poorer cognitive functioning, which is associated with higher parenting stress in fathers (Huhtala et al., 2011) and mothers (Brummelte et al., 2011, Huhtala et al., 2011).

It can be questioned whether a child's developmental status may affect other determinants of parenting stress, such as social support or marital satisfaction. If a child has a significant disability and/or requires ongoing treatment, having a support network or supportive partner might become even more important. For example, Meppelder et al. (2015) reported that social support functioned as a significant protective factor for parental role stress, in parents of children with an intellectual disability. It was unclear if this result applied to mothers and fathers, as the generic term 'parents' was used throughout the study.

Limitations of Previous Studies

Most of the studies mentioned above included either no fathers in their studies or only a limited number. Consequently, it remains unclear whether the relationship between infants' physical and cognitive functioning only applies to mothers, or for fathers as well. Moreover, some research studies solely distinguished between NICU born and term-born infants, instead of considering the actual developmental status of the infant.

Purpose of This Study

The aim of the present study is to examine whether poorer cognitive and physical functioning at age two (corrected age) predicts greater levels of parenting stress in fathers and mothers. The same sample of parents of NICU infants and term-born infants, as in studies 4 and 5, was studied focusing on this specific relationship. Additionally, in relation to the AB model, parental mental health and personality, marital satisfaction, work and social adjustment were assessed to study their impact on paternal stress. The same model as in chapter 8 (Figure 6, p. 188) was used for the analysis. The following research questions were considered:

1. Does the infant's cognitive and/or physical functioning predict parenting stress in fathers and mothers?
2. Do the determinants of parenting stress remain the same for fathers and mothers after the inclusion of the infant's developmental status?
3. Does the model including the infant's functioning sufficiently explain parenting stress across parents?

Method

Participants

The data from the same sample as in Study 4 and Study 5 was used for this study consisting of 242 mothers and 205 fathers of NICU born infants and 100 mothers and 89 fathers of term-born infants. The whole sample consisted of 294 fathers and 342 mothers and their infants. Demographic information can be found in chapter 7, Table 1 (p. 128f).

Procedure

As described in previous chapters, an experienced interviewer met each parent separately to conduct the first psychological assessment within three weeks of the infant's birth; the last assessment was conducted two years after the child's birth (two years corrected age). The assessments consisted of a set of self-report questionnaires and a paediatric assessment. The measurements used in this study were the PSI, HADS, DAS, TCI, SAS and the Mental and Physical Development Index of the BSID-II. For all questionnaires, only total scores were considered, with an exception of the Temperament and Character Inventory (TCI-144, Cloninger et al., 1994), where subscales were appropriate for the purpose of this study. All assessments have been outlined in earlier chapters and thus will not be presented again.

Data Analysis

The data analysis was divided into two parts: in a first step, mean scores and standard deviations were calculated for the parent measures and child cognitive and physical functioning using SPSS 22 (IBM Corp., 2015). The results of descriptive analyses have already been outlined in detail in Chapter 7, therefore only a summary of the parent and child descriptive statistics will be presented in this chapter. Spearman's *rho* was calculated to

examine the relationship between child functioning and parenting stress. In addition to (1) the continuous variables MDI/PDI, two additional dichotomous variables for the MDI and PDI were created: (2) MDI-1SD/PDI-1SD, which distinguish between infants with or without a score of at least $<1SD$ under the norm on either of the scales, and (3) MDI-2SD/PDI-2SD to classify infants with or without a score of at least $<2SD$ under the norm.

As a next step, path analysis was conducted with Mplus 7.11 (Muthén & Muthén, 1998-2013), to test if the child's functioning is a predictor (B) of parenting stress, and if the predictors identified in the previous chapter remain significant after the inclusion of child cognitive and physical functioning. R^2 was calculated to estimate how much variance in parenting stress the model explains. Model goodness of fit was assessed on the basis of a number of indices including: (a) The model chi square goodness of fit statistic (χ^2); (b) the Root Mean Squared Error of Approximation (RMSEA); (c) the Standardized Root Squared Residual (SRMR); and (d) the Comparative Fit Index (CFI). Intra-family factors, as a contributor to the variance of the model, were tested in the previous study and found to be non-significant; thus there was no need to account for intra-family effects in this study.

Results

Summary of Parental Measures

Most fathers experienced only low levels of anxiety/depression two years after the infant's birth (HADS: $M = 5.63$; $SD = 4.72$). Mothers also experienced mild levels of depressive symptoms and anxiety (HADS: $M = 7.45$, $SD = 6.01$). Mothers' total HADS scores two years after the infant's birth differed significantly from fathers', with mothers experiencing more total distress than fathers ($U = 33715.00$, $p = .001$). Mothers also reported

significantly more harm-avoidance (fathers: $M = 5.88$, $SD = 3.87$; mothers: $M = 9.13$, $SD = 4.58$; $U = 23203.00$, $p < .001$). The results for the remaining variables were similar across gender: fathers and mothers experienced low to moderate levels of parenting stress (fathers: $M = 61.22$, $SD = 16.35$; mothers: $M = 64.12$, $SD = 18.1$), high marital satisfaction (fathers: $M = 117.94$, $SD = 13.42$; mothers: $M = 116.63$, $SD = 16.24$), similar social adjustment scores (fathers: $M = 1.72$, $SD = 0.25$; mothers: $M = 1.71$, $SD = 0.27$) and self-directness scores (fathers: $M = 16.33$, $SD = 3.70$; mothers: $M = 16.31$, $SD = 3.82$). Only 7.6% of fathers were unemployed two years after their infant's birth, compared to 42% of mothers.

Child Functioning

Infant scores ranged between 50 and 120 on the MDI ($n = 279$) and for the PDI between 61 and 128 ($n = 281$), with a mean score on the MDI of 90.48 ($SD = 13.40$) and $M = 93.46$ on the PDI ($SD = 13.32$): both means are within the normal range. Of the infants, 141 (MDI-1SD) and 124 (PDI-1SD) could be classified as mildly delayed and 26/32 as severely delayed (MDI-2SD/PDI-2SD).

Research Question 1: Child Cognitive and Physical Functioning as a Predictor of Parenting Stress

Paternal parenting stress was not predicted by the infants MDI score ($B = 0.02$, $p = .634$), nor by the PDI score ($B = 0.01$, $p = .803$). The same pattern emerged for mothers. Maternal parenting stress could not be predicted by the infants' developmental status (MDI: $B = 0.02$, $p = .634$; PDI: $B = 0.01$, $p = .803$).

A correlation matrix (Table 20) was calculated to identify any significant associations between parenting stress and the MDI/PDI and MDI-1SD/PDI-1SD and MDI-2SD/PDI-2SD.

However, it should be noted that only a small number of infants ($n_{MDI-2SD} = 26$; $n_{PDI-2SD} = 32$) could be classified as having a severe delay ($<2SD$), and thus the analysis can be considered as explorative only. As shown in Table 20, there were no significant associations between either paternal or maternal parenting stress, and the infant's cognitive or physical developmental score.

Table 20

Study 6: Spearman Correlations Between Stress and Child Functioning in Fathers and Mothers

	PSI Fathers	PSI Mothers
MDI ¹	-.03	-.07
PDI ¹	.03	.01
MDI-1SD	.03	-.15
PDI-1SD	.13	.01
MDI-2SD	-.33	-.29
PDI-2SD	.26	.13

Note: 1 = continuous score; MDI-1SD/PDI-1SD = MDI/PDI $< 1SD$; MDI-2SD/PDI-2SD = MDI/PDI $< 2SD$.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

Research Question 2: Determinants of Parenting Stress After the Inclusion of the Child's Developmental Status

Only psychopathology ($B = 0.24$, $p < .001$) and social adjustment ($B = 0.22$, $p < .001$) predicted parenting stress in fathers in the present study (see Table 21 and Figure 7). Similarly to Study 5, parental personality did not predict parenting stress (SD: $B = -0.07$, $p = .198$; HA:

$B = 0.08, p = .088$). In contrast to Study 5, marital satisfaction ($B = -0.09, p = .059$) and work status ($B = -0.05, p = .381$) did not predict parenting stress in this study.

Similarly, in mothers, only psychopathology ($B = 0.30, p < .001$) and social adjustment ($B = 0.21, p < .001$) significantly predicted maternal parenting stress levels. As for fathers, neither marital satisfaction ($B = -0.10, p = .056$), nor personality (SD: $B = -0.06, p = .196$; HA: $B = 0.08, p = .086$) or work status ($B = -0.08, p = .178$) were identified as predictors of stress.

Table 21

Study 6: Predictors of Parenting Stress in Fathers and Mothers

	PSI Fathers	PSI Mothers
Child - MDI	0.02	0.02
Child - PDI	0.01	0.01
Personality - SD	-0.07	-0.06
Personality - HA	0.08	0.08
Psychopathology	0.24***	0.30***
Marital Satisfaction	-0.09	-0.10
Social Adjustment	0.22***	0.21***
Work	-.05	-.08
$p < .05^*, p < .01^{**}, p < .001^{***}$		

Table 22

Study 6: Parenting Stress Model Fit Indices Across Parents

Test	
Chi-Square Test of Model Fit	
χ^2	40.31
df	31
p	.122
Chi-Square Contribution from Each Group	
	17.64 (fathers)
	22.68 (mothers)
RMSEA estimate	0.04
CFI	0.94
SRMR value	.05

Note: χ^2 = Test of equivalence across gender

Discussion

Neither the cognitive, nor the physical developmental status of the infant predicted parenting stress in fathers or mothers. Only parental psychopathology and social adjustment were significant predictors of parenting stress in this study. Marital satisfaction, parental personality and work status did not predict parenting stress in Study 6. The model including child development fit well across parents and explained a similar amount of variance as the model used in chapter 8.

The importance of parental mental health has been stressed by many studies in the past. Parental well being seems to be a protective factor for parenting stress (Webster-Stratton, 1990) and the opposite - parental psychopathology, such as depression or anxiety, – is a risk factor for parenting stress (Theule et al., 2013). In the present study, this was confirmed as parental anxiety, and depressive symptoms were a strong predictor of parenting stress in both parents.

The impact of social adjustment on parenting stress had not been examined by previous studies. Social adjustment two years after the infant's birth significantly predicted parenting stress in fathers and mothers in this study. Social adjustment might be particularly important for parents of NICU infants, as they are often faced with a number of challenges that they need to adapt to. Immediately after birth, adjustment might be more difficult for parents of NICU infants, due to the separation from the infant and a possibly prolonged hospital stay (Razmus, 1994). As mentioned, NICU born infants are at a higher risk for developmental delay and physical illness, which can result in the need for ongoing treatment (Verma et al., 2003) and a constant adjustment process for the parents, based on the outcome and needs of their children.

It was perhaps surprising that the infants' cognitive and physical functioning failed to predict parenting stress as proposed in the AB model. Previous authors have found that that infants' physical and cognitive health is related to parenting stress (e.g., Tervo, 2012, Singer et al., 1999). However, it is to be noted that these studies focused mainly on mothers, and the majority of infants in the present sample had scores within the norm, indicating the absence of any developmental impairments. Singer et al. (1999) suggested that only mothers of high-risk infants experience increased parenting stress two years after birth; thus, analyses for infants with/without any delay and with/without a severe delay were conducted. However, no

significant effects between parenting stress and child functioning could be found on any of the domains (cognitive or physical), regardless of the degree of impairment of the infant (continuous score, mild delay, severe delay/impairment). The small number of infants with a severe delay in the present study might be the reason for this; further studies focusing on this particular subgroup are needed.

The inclusion of the infant data (cognitive and physical functioning) had an impact on other predictors of parenting stress, suggesting a different pattern from Study 5. One difference in the current study was that marital satisfaction and work failed to predict parenting stress. The previous study (chapter 7) and others have reported a strong relationship between parenting stress and decreased marital satisfaction and unemployment in fathers (Liu & Wang, 2015; Nomaguchi & Johnson, 2016) and mothers (Deater-Deckard & Scarr, 1996). It remains unclear why these relationships were not significant after including the infants' data, particularly given that it was suggested that marital satisfaction, for example, might be even more important if the infant has a physical or cognitive delay, as these infants may need more support than normally developed infants. Parents might also require more emotional support from their partners to cope with the uncertainty of the child's abilities and long-term developmental outcomes. It seems that despite not being a significant predictor itself, the inclusion of the infant's functioning has an impact on the other determinants of parenting stress.

The predictors of parenting stress in this study were the same for fathers and mothers, and the level of significance was almost identical across gender roles. This suggests that parenting stress can be predicted by the same determinants for fathers and mothers. This is in accordance with Deater-Deckard and Scarr (1996), who pointed out that fathers and mothers

are more similar than different when it comes to parenting stress. It also confirms the findings of Study 5, which showed that the same determinants predicted stress in fathers and mothers.

Strengths and Limitations

One of the limitations of this study is that additional variables other than the ones included in this study might have had an impact on parenting stress. For instance, Cardoso et al., (2010) suggested that ethnicity was a determinant of stress in their study, with women from certain ethnic/racial backgrounds reporting more parenting stress than others. The sample was too ethnically homogenous to conduct these analyses. The small number of infants with a severe delay also restricted the analyses, which can only be seen as exploratory.

This study has several strengths. Firstly, it included a large sample of fathers. It also assessed mothers' experience of parenting stress and consequently allowed the comparison of mothers and fathers. Parents were randomly selected from a large geographical area. Moreover, this study included a well-validated in-depth assessment of the cognitive and physical functioning of the infant, instead of a NICU vs. term-born distinction, or a simple measurement of weight and prematurity level only.

Implications for Future Studies

Future studies need to examine if additional variables should be considered when assessing paternal stress, such as ethnicity, socio-economic status, young parenthood or single parenting. For example, Seo and Moon (2012) reported that mothers from lower socio-economic groups experience more parenting stress. Shin, Nhan, Crittenden, Hong, and Ladinsky (2006) reported similar results for fathers: fathers with lower economic status experienced higher levels of parenting stress. However, Shin et al.'s (2006) study included

less than 100 fathers. McConnell, Breitzkreuz, and Savage (2010) also found that financial hardship and lower family income significantly predicted parenting stress. No distinction was made between mothers and fathers.

Further studies also need to examine in more detail whether having a child with a severe delay on any of the developmental domains could predict parenting stress in parents, as the number of severely impaired infants was low in this study. Shin et al. (2006), for example, reported mothers of children with a cognitive delay experienced significantly higher parenting stress levels than mothers of children without a delay. It is to be noted, that some of the children with a cognitive delay in Shin et al.'s (2006) study had other disabilities, which might have added to mothers' experience of stress. Baker et al. (2003) distinguished between children with and without a developmental delay, as measured on the BSID, and reported that mothers and fathers of developmentally delayed children experienced significantly higher stress levels. However, it remains unclear how many fathers participated.

Conclusion

In conclusion, parenting stress could not be predicted by the infants' cognitive or physical health at two years corrected age. Mothers and fathers' mental health and social adjustment were found to be significant predictors of stress. Neither personality, or work, nor marital satisfaction predicted parenting stress in any parent. Despite not being a significant predictor itself, the infant's developmental status had an impact on the other determinants of parenting stress.

Chapter 10: Final Conclusion

The final chapter in this thesis presents an integrated summary of the key findings that specifically relate to the relationship between paternal depression, parenting behaviours and stress and child functioning. Gender role differences in depression, parenting stress and its relationship to child functioning are discussed. The fit of the study findings to Belsky's adapted model of parenting is reviewed. Strengths and limitations of this thesis are highlighted. Clinical implications and directions for future research are considered before final conclusions are drawn.

Summary of Key Findings of this Thesis

This thesis aimed to examine the relationship between paternal depression, parenting behaviour and stress, and children's emotional, behavioural, cognitive and physical functioning. Fathers were the focus of this thesis, because the research findings on paternal depression were found to be limited, leaving many questions unanswered. To gain a better understanding of the relationship between paternal depression, parenting and child functioning, fathers' results were compared to mothers, to identify differences and similarities.

Previous research investigations on the relationship between parental depression and child functioning have predominantly focussed on mothers, and they have found a significant association between maternal depression and poorer child functioning. Fathers have become much more involved in childcare over the last few decades, and it was questioned if this

relationship also exists for fathers. To address the lack of current research studies reviewing the relationship between paternal depression and child functioning, and the limitations of the few existing reviews, a systematic review was conducted (Study 1). According to the studies included in the review, paternal depression was significantly associated with children's emotional and behavioural functioning.

Study 2 was conducted to explore the relationship between depression, parenting behaviours and emotional and behavioural child functioning in a sample of NZ fathers and their children. Even though fathers perceived that their mental health affects their fathering, paternal depression was only related to children's emotional and behavioural functioning in the youngest or only child in the family. Depressed (and anxious) fathers reported using more dysfunctional parenting behaviours, which were related to poorer emotional and behavioural functioning in some of the children.

It was suggested that depressed fathers might also experience higher levels of parenting stress. Researchers had previously found a relationship between maternal depression and parenting stress; no review had yet considered the relationship between paternal depression and parenting stress. Study 3 was a comprehensive literature review examining this relationship, and the results are in line with the findings for mothers: paternal depression was associated with greater parenting stress. It remained unclear if depression was indeed a predictor of stress, and whether fathers experience more or less stress than mothers, as the studies included in Study 3 reported mixed findings. Parenting stress in fathers compared to mothers was examined in Study 4. The relationship between depression, parenting stress and child emotional/behavioural, cognitive and physical functioning was investigated for both parents. Paternal depression was strongly associated with higher levels of parenting stress, but stress was not related to child functioning on any of the domains. The same results were found for mothers. The determinants of parenting stress in fathers compared to mothers were examined in Study 5. Fathers and mothers' stress was predicted by

paternal depression and anxiety, marital satisfaction, social adjustment and work. The child's admission status at birth (NICU vs. control) did not predict parenting stress at age two in any parent. It was argued that birth admission status alone might not explain the greater levels of parenting stress in NICU parents reported by previous research studies. Child developmental functioning at age two however, may determine parents' experience of stress. Study 6 (chapter 9) examined this, and found that neither child cognitive, nor physical functioning at age two (corrected age) predicted parenting stress in fathers or mothers.

Gender Role Differences in Depression, Parenting and its Relationship to Child Functioning

It was outlined in chapter 1 that, despite some similarities, overall men and women appear to experience different symptoms of depression, with women showing more internalising and traditional symptoms of depression such as sadness and crying (Vredenburg et al., 1986), whereas men reportedly experience more externalising, atypical symptoms of depression, such as anger or overinvolvement in work and appear to mask their depression more often (Brownhill et al., 2005; Genuchi & Mitsunaga, 2015). It was questioned whether the prevalence rate of male depression was underestimated due to common assessment tools neglecting to include male-specific symptoms. Studies that used gender-inclusive tools found similar rates across men and women (Martin et al., 2013). However, these tools are yet to be validated across different populations.

Despite some gender differences in the symptoms of depression, depressed fathers and mothers appeared to show similar parenting behaviours. Mothers were included in studies 3 to 6. Mothers experienced significantly more depressive symptoms and anxiety than fathers.

Despite this, maternal depression was not associated with child functioning on any of the domains in any of the studies conducted as part of this thesis. Maternal parenting behaviours were not investigated in the studies of this thesis and thus, the relationship between mothers' parenting behaviours and maternal depression could not be examined.

In regards to parenting stress, it was questioned whether mothers might experience higher levels of stress, due to their greater involvement in childcare compared to fathers. However, on reviewing the relationship between depression and parenting stress (Study 3), this could be neither confirmed, nor rejected, because the findings across the studies reviewed were inconsistent. Mothers and fathers' parenting stress levels were investigated in Study 4 (chapter 7), and the results showed that mothers experienced similar levels of parenting stress as fathers. In regards to the determinants of parenting stress, the findings also matched across gender roles: maternal parenting stress was predicted by the same variables (psychopathology, marital satisfaction, social adjustment) as fathers' stress. The child's admission status post-birth (NICU vs. control), and child cognitive or physical functioning, were also not predictors of parenting stress for mothers.

Summing up, mothers and fathers seem to show similarities and differences on the key constructs measured. Even though the expression of depression and levels of distress appear to be different, the parenting behaviours of depressed mothers and fathers, and the impact these can have on children, appear to be similar. Whilst paternal depression was found to be associated with child functioning in some of the studies, maternal depression was not associated with child functioning in any of the studies of this thesis. However, mothers were not included in Study 1 and Study 2. Mothers experienced similar levels of parenting stress as fathers, and psychopathology was associated with higher parenting stress levels for both parents. Child functioning did not predict parenting stress in either parent, regardless of the

level of impairment of the child. This thesis showed that despite some differences, mothers and fathers seem to be more similar than different.

The Adapted Belsky Model Fit: Paternal Depression, Parenting and Child Functioning

Belsky (1984) suggested that parental, social and child factors determine the quality of parenting (Figure 1, p. 51). After reviewing the literature, the model was adapted to reflect current research findings (e.g., psychopathology was added as a distinct variable). The model was employed as a framework for this thesis to examine paternal depression, parenting behaviour and stress and child emotional, behavioural, cognitive and physical functioning. The model was outlined in chapter 3 (Figure 2, p. 56), and the constructs and interrelationships were tested across the studies. The model fit will be reviewed in the following section.

Parental Factors

Psychopathology. Belsky (1984) suggested that parents' mental health could have an impact on their quality of parenting. Despite this Belsky did not consider a direct pathway between psychopathology and parenting in his model. After reviewing the existing literature, this path was added to the AB model and was confirmed by the results of this thesis.

Depressed fathers perceived they used more dysfunctional parenting behaviours than non-depressed fathers (Study 2). However, due to the small sample size, the results can only be seen as exploratory. Depressed and anxious fathers also reported higher levels of parenting stress (Study 4). Indeed, Study 5 showed that psychopathology was the strongest predictor of

paternal stress. Common symptoms of depression, such as fatigue or psychomotor retardation, could increase fathers' stress levels, as they might feel they do not have the resources to tackle the demands of parenting.

A relationship between psychopathology and marital satisfaction was also outlined in the AB model. The results of studies 2 and 5 supported this pathway: fathers who reported higher rates of paternal depressive symptoms reported less satisfaction in their marital relationship. An additional relationship was suggested during the data analysis: paternal psychopathology (depression & anxiety) may be related to lower levels of social adjustment. This relationship was explored and confirmed; fathers who appeared to experience higher levels of distress reported lower levels of social adjustment.

Furthermore, it was proposed in the AB model that work and psychopathology might influence each other. The results of this thesis lend support to this hypothesis: fathers experiencing more distress were more likely to be unemployed. This path could only be tested in the latter studies, as all of the participants in Study 2 were in paid employment.

Belsky (1984) did not consider a direct relationship between parental psychopathology and child functioning; however, after considering the research evidence, this pathway was also added to the AB model and explored. The findings of the systematic review (Study 1), presented in chapter 4, confirmed the suggested pathway between paternal depression and children's emotional and behavioural functioning. Despite of this, the empirical findings of Study 2, exploring the relationship between paternal depression and child functioning, could only partly support the AB model; a relationship was only found between paternal depression and child emotional and behavioural functioning for the youngest or only children. It was argued that the small sample size, and thus low number of fathers experiencing depression,

and the small number of children evidencing poor functioning, may explain the absence of significant findings for the oldest child-group. In addition, it was proposed that the inclusion of other domains of child functioning might change the results. Study 4 (chapter 7) attempted to address the limitations of Study 2 by using a larger sample of fathers from a clinical population, and not only were emotional and behavioural functioning investigated but also cognitive and physical child functioning. However, no relationship between paternal depression, nor anxiety and child cognitive, physical, emotional or behavioural functioning could be identified.

To conclude, the findings in regard to paternal psychopathology only partly supported the AB model, with some of the results confirming previous research outcomes, and others standing in contrast to them. When considering the relationship between depression and parenting behaviours, the results of this thesis are in accordance with previous research findings. Wilson and Durbin (2011) also reported in their meta-analysis, that depressed fathers appear to use fewer positive, and more dysfunctional parenting behaviours. Research on the relationship between paternal depression and parenting stress was found to be limited, and to date no review had been conducted to explore this relationship. Therefore, a review exploring the relationship between depression and parenting stress was conducted (chapter 6), and the results showed that higher levels of paternal depression were related to higher parenting stress levels. Thus, the empirical findings of this thesis on the relationship between depression and parenting stress lend support to previous research studies.

Belsky did not consider the relationship between psychopathology and marital satisfaction, nor social adjustment or work. The findings from previous investigations into the association between depression and marital satisfaction remain inconsistent (e.g., Gabriel, Beach, & Bodemann, 2010; Weinfield et al., 2009). The findings of the association between

psychopathology and lower levels of social adjustment is, however, in line with previous research findings. Furukawa et al. (2011) for example, reported that individuals with major depression show moderate to extremely large impairments in social adjustment. It is therefore not surprising that parental psychopathology was related to social adjustment, given the symptoms of withdrawal from social situations and general isolation seen in many depressed patients. As for social adjustment, the results for the variable 'work' match previous research findings, which also identified a relationship between higher levels of distress and unemployment (e.g., Ballard et al., 1994).

The empirical studies in this thesis only provided limited evidence for the pathway between paternal psychopathology and child functioning, and are therefore in contrast to the majority of previous research investigations. It can be questioned if the results would have been different if only fathers with a clinical diagnosis of depression were involved. Another explanation for the absence of a relationship between paternal psychopathology and child functioning in most of the studies of this thesis could be that additional variables might have acted as moderators or mediators but have not been considered in our studies. For example, it was proposed at the start of this thesis that the increase in paternal involvement might have led to children being more exposed to paternal symptoms of depression. Hence, measuring the level of paternal involvement might have aided the explanation of the absence of significant findings. Moreover, Brennan et al. (2002) suggested that fathers' expressed emotion may function as a significant mediator. This is not surprising, and it supports the idea that children might be more affected by paternal depression nowadays because they are more exposed to the emotional conditions of their fathers. Instead of measuring the symptoms of depression, it could be important to measure the actual emotions expressed by fathers. However, Brennan et al. (2002) also found a direct relationship between depression and child functioning and thus

it remains unclear whether the inclusion of a variable measuring expressed emotions would have changed the results of the studies.

Personality. Belsky (1984) proposed that parents' personality is influenced by their upbringing and their mental health. Personality traits, in turn, may have an affect on parental functioning. In addition, Belsky (1984) also hypothesised that work (employment status & job satisfaction) and social support affect parental personality. Empirical support was found for the relationship between mental health and personality: higher levels of paternal anxiety and depression were related to higher levels of harm avoidance and lower levels of self-directedness in Study 4. Belsky's proposed relationship between social support/adjustment and personality could also be confirmed: high levels of social impairment were associated with low levels of self-directedness and high levels of harm avoidance in fathers.

Contrary to Belsky's (1984) model, Study 5 demonstrated that parental bonding as measured with the PBI did not consistently determine parental personality; only maternal protection was shown to predict levels of harm-avoidance for fathers. Also, in contradiction to Belsky's model, was that neither personality variable predicted parenting stress. Belsky's (1984) hypothesis that personality and work are interrelated was also not fully supported. Work status was not associated with harm avoidance, and only showed borderline significance for self-directedness in the model. It is to be noted though, that the number of fathers who were unemployed at the time of the assessment was low. Moreover, the satisfaction with one's job as described by Belsky (1984) was not considered in this thesis. Instead of purely measuring social support, social adjustment was examined, which considers one's satisfaction with received support and their social functioning.

Some of the results associated with personality are in line with previous research findings. For example, Hansenne et al. (1999) reported that depressed individuals showed significantly higher levels of harm-avoidance and lower self-directedness than healthy controls. The relationship between bonding, personality and parenting suggested by Belsky (1984) has not been tested in depth before. Researchers examining attachment instead of bonding however, confirmed the proposed pathway (e.g., Van Bakel et al., 2002), which is in contrast to the results of Study 5. It remains unclear whether the different construct (bonding) tested in Study 5 may be an explanation for the results of Study 5. Bonding measured with the PBI assessed the level of care and overprotection parents felt they received from their own parents, and not necessarily how attached they felt to their parents. Bonding and attachment both describe the bond between an individual (often the child) and an attachment figure, and thus some authors have used the terms interchangeably (Carter, 2005). However, others have emphasised the differences with attachment, referring to the child seeking for an attachment figure, whilst bonding is described as the mother's instinct to bond with their child (Carter, 2005; Klaus, Kennel, & Klaus, 1995). Bonding, therefore, might not impact on the child's (the parents in this thesis) personality traits, but instead may affect their own parents' personality, which was not assessed in Study 5.

Social Factors

Marital satisfaction. Belsky (1984) proposed that marital relations might affect parenting. The results of this thesis lend support to his hypothesis. Fathers who were less satisfied in their marital relationship reported using more dysfunctional parenting behaviour and experienced more parenting stress. Marital satisfaction was also identified as a predictor of parenting stress in Study 5. However, after inclusion of the child's cognitive and physical functioning, marital satisfaction was no longer a predictor of fathers' stress levels. This

indicates that the child's developmental status may have a stronger impact than marital satisfaction, but statistical analyses could not confirm this.

Previous research studies have also shown a significant association between marital satisfaction and parenting behaviour (Cowan & Cowan, 1992). Inconsistent results were reported for the relationship between marital satisfaction and parenting stress (e.g., Stoneman et al., 1989; Theule et al., 2013); the results of Study 5 and Study 6 reflected this and showed that whether marital satisfaction is a determinant of stress depends on which determinants are added to the model.

Social adjustment. The second social or contextual factor in Belsky's (1984) model was measured as social adjustment. Lower social adjustment was a predictor of parenting stress, thus confirming Belsky's (1984) proposed path for parents of two-year-olds. Social adjustment remained a significant predictor of paternal parenting stress after the inclusion of the child's cognitive and physical functioning. Previous researchers typically examined social support, not adjustment, and its effect on parenting stress. Similar to social adjustment, higher levels of social support were reported to be associated with lower levels of parenting stress (Deater-Deckard, 1998).

Work. Belsky (1984) described work, measured as unemployment and job satisfaction, as a possible determinant of parental functioning. The results of Study 5 showed that work was a significant predictor of parenting stress with unemployment predicting higher levels of parenting stress. This result is in line with previous research findings. For example, Nomaguchi and Johnson (2016) stated that fathers who were unemployed reported higher levels of parenting stress.

Child Factor

The results of this thesis only found support for some child-related pathways suggested in the AB model. Firstly, a relationship between parenting behaviours and child functioning was identified. Dysfunctional parenting behaviours were related to poorer child functioning in the youngest or only child. Infants and younger children are more dependent of their parents, and therefore often spend more time with them than older children or adolescents, who also spend more time in educational settings or with peers (Bornstein, 2002). The increased exposure to parents' dysfunctional parenting behaviours might increase the risk of developing difficulties.

The results of Study 2 confirmed the pathway between child functioning and marital satisfaction: higher levels of emotional and behavioural problems in children were related to lower levels of marital satisfaction in the youngest-child-group. It was suggested that the older children may be more able to cope with the stressors of marital conflicts, or may remove themselves from the situation by spending more time outside of the family environment. No association was found between a child's birth status and marital satisfaction in Study 5 and Study 6.

Contrary to previous research findings, the suggested pathway between psychopathology and child functioning was only confirmed by Study 1, and partly by Study 2, but no relationship could be identified in the remaining studies (see above). Also, in contrast to the AB model, the child variable did not function as a predictor of parenting stress in Study 5. It was argued that birth admission status alone might not be sufficient to distinguish between optimally developed children and children who experience difficulties. Building on the results from Study 5, the impact of specific child outcomes (cognitive and physical

functioning) on parenting stress were tested in Study 6. However, neither child cognitive, nor physical functioning predicted parenting stress in fathers.

To conclude, the findings of this thesis, that dysfunctional parenting behaviours and lower levels of marital satisfaction were related to poorer functioning in children, are in line with previous research outcomes (Grych & Fincham, 1990; Mattejat & Remschmidt, 2008). The relationship between parenting behaviour and child functioning has been described in detail in chapter 3. Higher levels of dysfunctional parenting behaviours, such as hostility, might affect children negatively in their development. In regard to marital satisfaction, researchers have reported that couples that show low levels of marital satisfaction typically report high levels of conflicts (Cui, Donellan, & Johnson, 2009). The observation of parental conflicts can have a negative impact on children as they may perceive themselves as the cause of the conflict (Grych & Fincham, 1993), or if conflicts occur repeatedly, they might start modelling their parents' behaviour (Bandura et al., 1977).

The finding of Study 5 and Study 6, that child outcomes (birth status; cognitive and physical functioning) are not related to parents' experience of parenting stress, stands in contrast to some research findings. For example, Singer et al. (1999) reported that mothers of high-risk NICU-born infants persistently experienced higher stress levels over the years after birth than mothers of low risk NICU-born infants. The results of Study 6 might be explained by the small number of children involved in this study that had a significant delay. As aforementioned, low sample sizes restrict the studies' statistical power; studies with a lack of power are less likely to detect true effects. On the other hand, by age two, parents might have recovered from the stressors associated with an NICU birth, or adjusted to any challenges a NICU-born infant might bring. Some researchers, such as Treyvaud and others (2011), reported that parents of NICU infants did not experience more parenting stress when their

toddler was two years of age. However, the same authors also reported that by age seven, differences in stress levels between parents of NICU-born children and term-born children emerged again. This could be related to the children starting school, and thus developmental delays might be identified, causing the experience of stress in parents.

Summary of the AB model fit. Summing up, the AB model was largely supported by the findings of this thesis. As expected, paternal depression had an impact on parenting stress and parenting behaviour. An increase in dysfunctional parenting behaviours, in turn, was associated with more child emotional and behavioural problems. Child functioning was also related to marital satisfaction. Paternal psychopathology was a strong predictor of parenting stress and influenced by personality traits, employment status, marital satisfaction and social adjustment. Parenting stress was not only predicted by paternal psychopathology, but also by marital satisfaction, social adjustment and work. Work was only related to self-directedness but the association was weak. As hypothesised, personality and social adjustment were related, with higher levels of self-directedness and lower levels of harm-avoidance being associated with better adjustment. An additional pathway was identified and added to the model: social adjustment was significantly linked to marital satisfaction.

Probably the most striking finding was that child functioning (emotional, behavioural, cognitive, physical) was only associated with paternal psychopathology in some of the studies. Child functioning was also not associated with parenting stress. Also contrary to expectations was that the pathway between bonding and personality was not confirmed and none of the personality traits had an impact on parenting stress. After considering the results of this thesis, the model was updated and is presented in Figure 8.

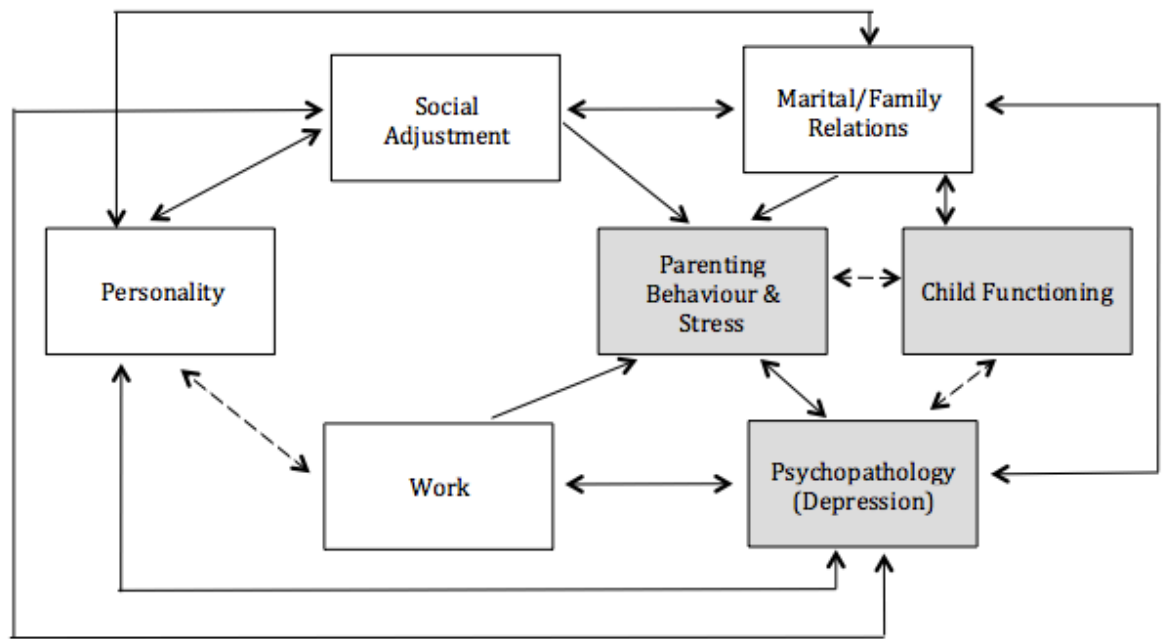


Figure 9. Updated AB model presenting the results of this thesis.

It should be noted that other factors that were not considered in the AB model could have had an impact on the relationship between depression, parenting and child functioning. Goodman and Gotlib (1999), for example, developed a model of risk transmission from a depressed mother to their children. This model was then adapted for fathers by Ramchandani and Psychogiou (2009). The authors suggested that aside from parenting behaviours and marital satisfaction, maternal mental health and genes also need to be considered when examining the relationship between paternal depression and child functioning. Having two depressed parents has been associated with greater child psychopathology (Brennan, Katz, Hammen, & Le Broque, 2002). This might be explained due to the double effect of being exposed to the symptoms of depression, such as negativity and anger, as well as the lack of a positive counterbalance that can function as a buffer to protect children from the effects of parental depression (Hossain et al., 1994; Tannenbaum & Forehand, 1994). As discussed in chapter 1, studies examining the role of genes in the onset of depression have reported mixed findings as to whether the 5-HTTLPR gene is associated with depression (Laucht et al., 2009;

Rish et al., 2009). As a consequence, it remains unclear to what extent genes play a role in the development of psychopathology in the offspring of depressed parents. Maternal mental health and genes were not considered as mediators in the AB model, and thus were not tested in this thesis. Future studies need to investigate whether these variables need to be added to the model.

Strengths and Limitations

Each of the studies conducted as part of this thesis showed a number of limitations, which were discussed in each chapter, and most of them were addressed by the consecutive studies. One example for this is the small sample size of fathers included in Study 2. In addition, even though the studies were open to participants of any ethnic background, no participant who identified primarily as Māori participated in the first study, and the numbers were higher but still low in the consecutive studies. Despite assessing a wide range of variables that could be related to fathers' experience of depression and parenting stress, it is likely that further variables could have had an impact on the associations under consideration. Whilst using the data from the Parents and the Footprint study had advantages, such as providing data on a large sample of fathers, it also had limitations. For example, the interrelationships between certain variables such as parenting stress and parenting behaviours could not be tested as these were not assessed in the studies. Even though the assessment tools used in this thesis all showed good psychometric properties, a limitation of them was that they were all self-report assessments, which can only be seen as screenings and underlie the risk of biased responses.

Despite limitations, this was the first study in New Zealand to explore paternal depression and its relationship to child functioning specifically. Paternal depression was

assessed over two time points in Study 4, to identify any differences in the levels of postnatal depression compared to depression at a later stage. The studies included fathers from all over the country, and from different educational backgrounds. As a result of using community and clinical samples, it was possible to investigate the relationship between depression and child functioning in two different populations. Contrary to previous research studies, studies 3 - 6 included a large sample of fathers, whilst also including mothers, to detect possible gender differences. Another strength of the studies included in this thesis was the assessment of a wide range of child functioning. Previous studies have often only focussed on one or two domains, whereas here, child functioning within the domains emotional, behavioural, cognitive and physical development were considered. Possible mechanisms of risk transmission, such as parenting behaviour were explored and variables that had previously received little attention such as paternal anxiety, family functioning or parenting stress were examined. Additionally, a social desirability assessment was included in Study 1, to eliminate the risk of a social desirability bias by the participants.

Directions for Future Research

The directions for future research are based on the limitations of this thesis outlined in previous chapters and summarised above. One major criticism of study one was the low number of participants. Sherr, Davé, Lucas, Senior, and Nazareth (2006) explored the efficacy of different recruitment strategies and found that the best response rate was yielded when contacting fathers directly on the postnatal ward; this also seemed successful in the Parents study. Future research studies should consider this when aiming to recruit fathers for research studies.

In addition, the numbers of participants identifying as Maori across the studies was low. The Health Research Council of New Zealand (2010) recommends seeking consultation if Māori are involved in the research study, but also emphasises that the consultation should be appropriate for the scale of the project and its significance for Māori. This thesis did not have a focus on Māori, and therefore was not based on kaupapa Māori research. However, to increase Māori participation, it should be considered to consult Māori research groups to ensure research is appropriate and considerate of Māoritanga.

More longitudinal research studies are needed to study the effects of paternal depression on child functioning over the course of the child's life. The Growing Up in New Zealand study is following NZ families for 21 years and has recently published a first paper on paternal depression, and reported that 4.3% of NZ fathers experienced postnatal depression (Underwood et al., 2017). This study might be able to provide longitudinal data on paternal depression over the coming years.

Future studies should also examine the impact a child's impairment can have on fathers' parenting stress, by including sufficient numbers of children who experience difficulties. This could only be examined in an explorative way in the studies in this thesis. Some authors have argued that depressed parents' reports on their children could be biased (e.g., Najman et al., 2001). It is recommended that future studies consider the inclusion of other methods of measurements, such as observation or clinical interviews.

Despite including a large range of variables that might have an impact on fathers' depression, parenting stress and/or child functioning, additional variables that were not assessed in this thesis could play an important role. Future research should examine additional

variables, such as expressed emotions, and their impact on the three key variables (paternal depression, parenting and child functioning).

Clinical Implications

The vast amount of research on maternal depression has led to improvements in the implementation of depression screenings and treatment for mothers who experience depressive symptoms. As shown in this thesis, depressive symptoms also occur in fathers, and can affect many areas of functioning, such as work, personality, marital satisfaction and social adjustment. Depression was also found to be associated with a higher usage of dysfunctional parenting behaviours and higher levels of parenting stress. These findings highlight the need to increase depression screenings for fathers. Clinicians should consider using male-symptom specific screenings to ensure that fathers do not fall through the net when being assessed for this psychological disorder. Moreover, parenting support should be offered to fathers, especially if the father experiences depression. This is to ensure that their mental health does not affect their parenting behaviour in a negative way, which in turn could affect their children.

The results of this thesis showed that child functioning does not predict parenting stress as typically suggested. However, other determinants of stress were identified, indicating that instead of focussing on the child's functioning as the cause of parenting stress, clinicians and support workers should consider any issues that may persist in the marital relationship, the social adjustment of the parent, or explore the employment situation as a probable stressor when supporting parents with reducing parenting stress levels.

Moreover, low levels of marital satisfaction were associated with paternal depression and poorer child functioning. This suggests that whilst paternal depression may not affect children directly, it has an impact on other constructs within the family system, which consequently may affect their children. Clinicians should consider the couple relationship between the mother and fathers as a possible stressor for children. Previous researchers have shown that improving the couple relationship is associated with better child outcomes (e.g., Cowan & Cowan, in Schulz, 2010).

Final Conclusion

Belsky's model of parenting was adapted and used as a framework for this thesis and, apart from some modifications, was largely supported. Contrary to previous research findings, paternal depression was only associated with less optimal emotional and behavioural child functioning in some of the studies conducted as part of this thesis. No association was found between paternal depression and child cognitive and physical functioning. A significant relationship was identified between depression and parenting. Depressed fathers used more dysfunctional parenting behaviours, and higher levels of depression and anxiety in fathers and mothers were associated with greater parenting stress levels. Psychopathology (depression and anxiety) was the strongest predictor of parenting stress for both parents, followed by marital satisfaction, social adjustment and work. Child functioning did not predict parenting stress in either parent.

Overall, this thesis showed that, despite some gender differences in the expression, prevalence rates and levels of depression, mothers and fathers also showed many similarities. Depressed mothers and fathers show similar parenting behaviours and also experience similar levels of parenting stress. Parenting is no longer a mother-only- topic, and thus fathers should

not be neglected in research and clinical practice, especially when they experience depressive symptoms. Child functioning may not be the main cause of parenting stress; clinicians should consider other factors such as the couple relationship when supporting parents. Further research studies are needed to examine the relationship between paternal depression, parenting, and child functioning, in a NZ sample over time, to validate the findings of this thesis.

References

- Abidin, R. R. (1992). The determinants of parenting behavior. *Journal of Clinical Child Psychology, 21*, 407-412. http://dx.doi.org/10.1207/s15374424jccp2104_12
- Abidin, R. R. (1995). *Parenting Stress Index: Professional Manual* (Vol. 3). Odessa, FL: Psychological Assessment Resources, Inc.
- Abidin, R. R. (2012). *Parenting Stress Index*. Odessa, FL: Psychological Assessment Resources, Inc.
- Addis, M. E. (2008). Gender and depression in men. *Clinical Psychology Science and Practice, 15*, 153-168. <http://dx.doi.org/10.1111/j.1468-2850.2008.00125.x>
- Adli, M., Haidari, H., Zarei, E., & Sadeghifard, M. (2013). Relationship between emotional and social adjustment with marital satisfaction. *Journal of Life Science and Biomedicine, 3*, 118-122.
- Ainsworth, P. M. D. (2000). *Understanding depression*. Jackson: University Press of Mississippi.
- Alegre, A. (2012). The Relation Between the Time Mothers and Children Spent Together and the Children's Trait Emotional Intelligence. *Child & Youth Care Forum, 41*, 493. <http://dx.doi.org/10.1007/s10566-012-9180-z>
- Alexandrino-Silva, C., Wang, Y.-P., Carmen Viana, M., Bulhões, R. S., Martins, S. S., & Andrade, L. H. (2013). Gender differences in symptomatic profiles of depression: results from the São Paulo Megacity Mental Health Survey. *Journal of affective disorders, 147*, 355-364. <http://dx.doi.org/10.1016/j.jad.2012.11.041>
- American Psychiatric Association - APA (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5Æ)*. Washington, US: American Psychiatric Publishing.
- Anding, J. E., Röhrle, B., Grieshop, M., Schücking, B., & Christiansen, H. (2016). Couple

- comorbidity and correlates of postnatal depressive symptoms in mothers and fathers in the first two weeks following delivery. *Journal of affective disorders*, 190, 300-309.
<http://dx.doi.org/10.1016/j.jad.2015.10.033>
- Anthony, L. G., Anthony, B. J., Glanville, D. N., Naiman, D. Q., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behaviour and preschoolers' social competence and behaviour problems in the classroom. *Infant and Child Development*, 14, 133-154. <http://dx.doi.org/10.1002/icd.385>
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment*, 10, 176-181. <http://dx.doi.org/10.1037/1040-3590.10.2.176>
- Areias, M. E., Kumar, R., Barros, H., & Figueiredo, E. (1996). Correlates of postnatal depression in mothers and fathers. *BJP*, 169, 36-41.
<http://dx.doi.org/10.1192/bjp.169.1.36>
- Arnold, D. S., O'Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment*, 5, 137-144. <http://dx.doi.org/10.1037/1040-3590.5.2.137>
- Arockiasamy, V., Holsti, L., & Albersheim, S. (2008). Fathers' experiences in the neonatal intensive care unit: A search for control. *Pediatrics*, 121, e215.
- Bai, A., Shukla, V. K., Bak, G., & Wells, G. (2012). *Quality assessment tools project report*. National Library of Canada, Ottawa, Ontario.
- Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research*, 47, 217-230.
<http://dx.doi.org/10.1046/j.1365-2788.2003.00484.x>
- Ballard, C. G., Davis, R.M., Cullen, P.C., Mohan, R.N., & Dean, C. (1994). Prevalence of

- postnatal psychiatric morbidity in mothers and fathers. *BJP*, 164, 782-788.
- <http://dx.doi.org/10.1192/bjp.164.6.782>
- Bandura, A. (1977). Social learning theory. Englewood Cliffs, N.J.: Prentice Hall.
- Barnard, K. E., & Martell, L. K. (1995). Mothering. In M. H. Bornstein (Ed.), *Handbook of Parenting* (Vol. 3). Mahwah, NJ: Lawrence Erlbaum Associates.
- Bayley, N. (1993). *Bayley Scales of Infant Development (2nd ed.)*. San Antonio, TX: Psychological Corporation.
- Beardselee, W. R., Versage, E. M., & Gladstone, T. R. G. (1998). Children of affectively ill parents: A review of the past 10 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, 37, 1134-1141. <http://dx.doi.org/10.1097/00004583-199811000-00012>
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of general psychiatry*, 4, 561.
- Beck, C. T., & Gable, R. K. (2000). Postpartum Depression Screening Scale: development and psychometric testing. *Nursing research*, 49, 272.
- Bellman, M., Byrne, O., & Sege, R. (2013). Developmental assessment of children. *BMJ: British Medical Journal*, 346, 31-35. <http://dx.doi.org/10.1136/bmj.e8687>
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, 55, 83-96. <http://dx.doi.org/10.1111/j.1467-8624.1984.tb00275.x>
- Benson, J. B., & Haith, M. M. (2009). *Social and emotional development in infancy and early childhood* (1st ed.). Oxford: Academic.
- Berger, J. L., Addis, M. E., Green, J. D., Mackowiak, C., & Goldberg, V. (2013). Men's reactions to mental health labels, forms of help-seeking, and sources of help-seeking advice. *Psychology of Men & Masculinity*, 14, 433-443.

<http://dx.doi.org/10.1037/a0030175>

Berk, L. E. (2013). *Child development* (Vol. 9th). Boston: Pearson.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of psychosomatic research*, 52, 69-77. [http://dx.doi.org/10.1016/S0022-3999\(01\)00296-3](http://dx.doi.org/10.1016/S0022-3999(01)00296-3)

Bloch, M., Daly, R. C., & Rubinow, D. R. (2003). Endocrine factors in the etiology of postpartum depression. *Comprehensive Psychiatry*, 44, 234-246. [http://dx.doi.org/10.1016/S0010-440X\(03\)00034-8](http://dx.doi.org/10.1016/S0010-440X(03)00034-8)

Canterbury District Health Board (2016). *Canterbury Wellbeing Index 2016*. Christchurch: Canterbury District Health Board.

Crnic, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: relations to maternal parenting and child behaviour at age 5. *Infant and Child Development*, 14, 117-132. <http://dx.doi.org/10.1002/icd.384>

Beardselee, W. R., Versage, E. M., & Gadstone, T. R. G. (1998). Children of Affectively Ill Parents: A Review of the Past 10 Years. *Journal of the American Academy of Child & Adolescent Psychiatry*, 37, 1134-1141. <http://dx.doi.org/10.1097/00004583-199811000-00012>

Bornstein, M. H. (1995). *Handbook of parenting*. Mahwah, N.J: Lawrence Erlbaum Associates.

Bornstein, M. H. (2002). *Handbook of parenting* (Vol. 2nd). Mahwah, N.J: Erlbaum.

Bould, H., Araya, R., Pearson, R. M., Stapinski, L., Carnegie, R., & Joinson, C. (2014). Association between early temperament and depression at 18 years: Research article: Early temperament and later depression. *Depression and Anxiety*, 31, 729-736. <http://dx.doi.org/10.1002/da.22294>

Bowlby, J. (1958). The nature of the child's tie to his mother. *Int J Psychoanal*, 39, 350-373.

Boyd, J. H., Myrna, M., & Weissman, M. (1981). Epidemiology of affective disorders

- a reexamination and future directions. *Arch Gen Psychiatry*, 38, 1039-1049.
- Brändström, S., Schlette, P., Przybeck, T. R., Lundberg, M., Forsgren, T., Sigvardsson, S., . . .
Hälsouniversitetet. (1998). Swedish normative data on personality using the
temperament and character inventory. *Comprehensive Psychiatry*, 39, 122-128.
[http://dx.doi.org/10.1016/S0010-440X\(98\)90070-0](http://dx.doi.org/10.1016/S0010-440X(98)90070-0)
- Brennan, P. A., Katz, A. R., Hammen, C., & Le Brocque, R. M. (2002). Maternal depression,
paternal psychopathology, and adolescent diagnostic outcomes. *Journal of Consulting
and Clinical Psychology*, 70, 1075-1085. <http://dx.doi.org/10.1037//0022-006X.70.5.1075>
- Bromet, E., Andrade, L. H., Hwang, I., Sampson, N. A., Alonso, J., de Girolamo, G., . . .
Kessler, R. C. (2011). Cross-national epidemiology of DSM-IV major depressive
episode. *BMC Med*, 9, 90. <http://dx.doi.org/10.1186/1741-7015-9-90>
- Brown, G. W., & Moran, P. M. (1997). Single mothers, poverty and depression.
Psychological Medicine, 27, 21-33. <http://dx.doi.org/10.1017/S0033291796004060>
- Brownhill, S., Wilhelm, K., Barclay, L., & Schmied, V. (2005). 'Big build': hidden depression
in men. *Australian and New Zealand Journal of Psychiatry*, 39, 921-931.
<http://dx.doi.org/10.1080/j.1440-1614.2005.01665.x>
- Brummelte, S., Grunau, R. E., Synnes, A. R., Whitfield, M. F., & Petrie-Thomas, J. (2011).
Declining cognitive development from 8 to 18 months in preterm children predicts
persisting higher parenting stress. *Early Human Development*, 87, 273-280.
<http://dx.doi.org/10.1016/j.earlhumdev.2011.01.030>
- Byles, J., Byrne, C., Boyle, M. H., & Offord, D. R. (1988). Ontario child health study:
Reliability and validity of the General Functioning Subscale of the McMaster Family
Assessment Device. *Fam Proc*, 27, 97-104.
- Bylund, A., Årestedt, K., Benzein, E., Thorell, A., Persson, C., & Linköpings University
(2016). Assessment of family functioning: evaluation of the General Functioning

- Scale in a Swedish Bariatric Sample. *Scandinavian Journal of Caring Sciences*, 30, 614-622. <http://dx.doi.org/10.1111/scs.12269>
- Callender, K. A., Olson, S. L., Choe, D. E., & Sameroff, A. J. (2012). The effects of parental depressive symptoms, appraisals, and physical punishment on later child externalizing behavior. *Journal of abnormal child psychology*, 40, 471-483. <http://dx.doi.org/10.1007/s10802-011-9572-9>
- Campbell, S. B., Morgan-Lopez, A. A., Cox, M. J., McLoyd, V. C., National Institute of Child, H., & Human Development Early Child Care Research, N. (2009). A latent class analysis of maternal depressive symptoms over 12 years and offspring adjustment in adolescence. *Journal of Abnormal Psychology*, 118, 479-493. <http://dx.doi.org/10.1037/a0015923>
- Capron, L. E., Glover, V., Pearson, R. M., Evans, J., O'Connor, T. G., Stein, A., . . . Ramchandani, P. G. (2015). Associations of maternal and paternal antenatal mood with offspring anxiety disorder at age 18 years. *Journal of affective disorders*, 187, 20-26. <http://dx.doi.org/10.1016/j.jad.2015.08.012>
- Cardoso, J. B., Padilla, Y. C., & Sampson, M. (2010). Racial and ethnic variation in the predictors of maternal parenting stress. *Journal of Social Service Research*, 36, 429-444. <http://dx.doi.org/10.1080/01488376.2010.510948>
- Carey, M. P., Spector, I. P., Lantinga, L. J., & Krauss, D. J. (1993). Reliability of the Dyadic Adjustment Scale. *Psychological Assessment*, 5, 238-240. <http://dx.doi.org/10.1037/1040-3590.5.2.238>
- Carter, C. S. (2005). *Attachment and bonding: a new synthesis* (Vol. 92.). Cambridge, Mass: MIT Press in cooperation with Dahlem University Press.
- Carter, J. D., Joyce, P.R., Mulder, R.T., Luty, S. E., & McKenzie, J. (2004). Gender & depression: A summary. *New Zealand College of Clinical Psychology Journal*, 14, 31-37.

- Carter, J. D., Mulder, R. T., & Darlow, B. A. (2007). Parental stress in the NICU: the influence of personality, psychological, pregnancy and family factors. *Personality and Mental Health, 1*(1), 40-50. <http://dx.doi.org/10.1002/pmh.4>
- Castel, S., Creveuil, C., Beunard, A., Blaizot, X., Proia, N., & Guillois, B. (2016). Effects of an intervention program on maternal and paternal parenting stress after preterm birth: A randomized trial. *Early Human Development, 103*, 17-25. <http://dx.doi.org/10.1016/j.earlhumdev.2016.05.007>
- Caughy, M. O. B., Huang, K.-Y., & Lima, J. (2009). patterns of conflict interaction in mother–toddler dyads: differences between depressed and non-depressed mothers. *Journal of Child and Family Studies, 18*, 10-20. <http://dx.doi.org/10.1007/s10826-008-9201-6>
- Celikel, F. C., Kose, S., Cumurcu, B. E., Erkorkmaz, U., Sayar, K., Borckardt, J. J., & Cloninger, C. R. (2009). Cloninger's temperament and character dimensions of personality in patients with major depressive disorder. *Comprehensive Psychiatry, 50*, 556-561. <http://dx.doi.org/10.1016/j.comppsy.2008.11.012>
- Charlson, F. J., Ferrari, A. J., Flaxman, A. D., & Whiteford, H. A. (2013). The epidemiological modelling of dystymia: Application for the global burden of disease study 2010. *Journal of affective disorders, 151*, 111-120. <http://dx.doi.org/10.1016/j.jad.2013.05.060>
- Chisholm, J. (1990). The Read clinical classification. *BMJ (Clinical research ed.), 300*, 1092-1092. <http://dx.doi.org/10.1136/bmj.300.6732.1092>
- Cloninger, C. R. (1994). Temperament and personality. *Current Opinion in Neurobiology, 4*, 266-273. [http://dx.doi.org/10.1016/0959-4388\(94\)90083-3](http://dx.doi.org/10.1016/0959-4388(94)90083-3)
- Cloninger, C. R., Przybeck, T. R., Svrakic, S., & Wetzel, R. (1994). *The Temperament and Character Inventory (TCI). A guide to its development and use*. Missouri, USA: Centre for Psychobiology and Personality.

- Cloninger, C. R., & Svrakic, D. M. (1997). Integrative psychobiological approach to psychiatric assessment and treatment. *Psychiatry*, 60, 120.
- Cochran, S. V., & Rabinowitz, F. E. (2000). *Men and depression: clinical and empirical perspectives*. London;San Diego, Calif,: Academic.
- Cohen, J. (1960). A Coefficient of Agreement for Nominal Scales. *Educational and Psychological Measurement*, 20, 37-46.
<http://dx.doi.org/10.1177/001316446002000104>
- Committee on Depression, P. P., & the Healthy Development of, C. (2009). *Depression in parents, parenting, and children: opportunities to improve identification, treatment, and prevention*. Washington, D.C: National Academies Press.
- Conger, R. D., Ge, X., Elder, G. H., Lorenz, F. O., & Simons, R. L. (1994). Economic stress, coercive family process, and developmental problems of adolescents. *Child Development*, 65, 541-561. <http://dx.doi.org/10.1111/j.1467-8624.1994.tb00768.x>
- Connell, A. M., & Goodman, S.H. (2002). The association between psychopathology in fathers versus mothers and children's internalizing and externalizing behavior problems: A meta-analysis. *Psychological Bulletin*, 128.
<http://dx.doi.org/10.1037//0033-2909.128.5.746>
- Corp, I. (2015). IBM SPSS Statistics for Macintosh (Version 23). Armonk, NY: IBM Corp.
- Couper, M. P. (2000). Usability evaluation of computer-assisted survey instruments. *Social Science Computer Review*, 18, 384-396.
<http://dx.doi.org/10.1177/089443930001800402>
- Cowan, C. P., & Cowan, P. A. (1992). *When partners become parents: the big life change for couples*. New York: BasicBooks.
- Cox, B. J., McWilliams, L. A., Enns, M. W., & Clara, I. P. (2004). Broad and specific personality dimensions associated with major depression in a nationally representative sample. *Comprehensive Psychiatry*, 45, 246-253.

<http://dx.doi.org/10.1016/j.comppsy.2004.03.002>

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression.

Development of the 10-item Edinburgh Postnatal Depression Scale. *The British Journal of Psychiatry*, 150, 782-786. <http://dx.doi.org/10.1192/bjp.150.6.782>

Crnic, K., & Low, C. (2002). Everyday stresses and parenting. In M. H. Bornstein (Ed.), *Handbook of Parenting* (Vol. 5, pp. 243-268). New Jersey, USA: Lawrence Erlbaum.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349-354.

<http://dx.doi.org/10.1037/h0047358>

Cuenca Montesino, M. L., Graña Gómez, J. L., Peña Fernández, M. E., & Andreu Rodríguez, J. M. (2013). Psychometric properties of the Dyadic Adjustment Scale (DAS) in a community sample of couples. *Psicothema*, 25, 536-541.

<http://dx.doi.org/10.7334/psicothema2013.85>

Cui, M., Donnellan, M. B., & Johnson, D. (2009). Trajectories of conflict over raising adolescent children and marital satisfaction. *Journal of Marriage and Family*, 71, 478-494. <http://dx.doi.org/10.1111/j.1741-3737.2009.00614.x>

Cummings, E. M., Cheung, R. Y. M., & Davies, P. T. (2013). Prospective relations between parental depression, negative expressiveness, emotional insecurity, and children's internalizing symptoms. *Child psychiatry and human development*, 44, 698.

<http://dx.doi.org/10.1007/s10578-013-0362-1>

Cummings, E. M., & Davies, P. (2010). *Marital conflict and children: an emotional security perspective*. New York: Guilford Press.

Cummings, E. M., Davies, P., & Campbell, S. B. (2000). *Developmental psychopathology and family process: theory, research, and clinical implications*. New York: Guilford Press.

Cummings, E. M., Keller, P. S., & Davies, P. T. (2005). Towards a family process model of

- maternal and paternal depressive symptoms: exploring multiple relations with child and family functioning. *J Child Psychol Psychiatry*, 46, 479-489.
<http://dx.doi.org/10.1111/j.1469-7610.2004.00368.x>
- Cummings, E. M., Melissa, R. W. G., Koss, K. J., & Davies, P. T. (2013). Parental depressive symptoms and adolescent adjustment: responses to children's distress and representations of attachment as explanatory mechanisms. *Parenting*, 13, 213.
- Cunningham, B. (2000). The Good Business of Being Father-Friendly. *Child Care Information Exchange* 9/00, 70, 1-2.
- Davé, S., Petersen, I., Sherr, L., & Nazareth, I. (2010). Incidence of maternal and paternal depression in primary care: a cohort study using a primary care database. *Arch Pediatr Adolesc Med*, 164, 1038-1044. <http://dx.doi.org/10.1001/archpediatrics.2010.184>
- Davé, S., Sherr, L., Senior, R., & Nazareth, I. (2008). Associations between paternal depression and behaviour problems in children of 4-6 years. *Eur Child Adolesc Psychiatry*, 17, 306-315. <http://dx.doi.org/10.1007/s00787-007-0672-6>
- Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development*, 77, 44-58.
<http://dx.doi.org/10.1111/j.1467-8624.2006.00855.x>
- Davis, R. N., Caldwell, C. H., Clark, S. J., & Davis, M. M. (2009). Depressive symptoms in nonresident African American fathers and involvement with their sons. *Pediatrics*, 124, 1611.
- Davis, R. N., Davis, M. M., Freed, G. L., & Clark, S. J. (2011). Fathers' depression related to positive and negative parenting behaviors with 1-year-old children. *Pediatrics*, 127, 612.
- De Fruyt, F., Van De Wiele, L., & Van Heeringen, C. (2000). Cloninger's Psychobiological Model of Temperament and Character and the Five-Factor Model of Personality. *Personality and Individual Differences*, 29, 441-452. <http://dx.doi.org/10.1016/S0191->

- Deater-Deckard, K. (1998). Parenting stress and child adjustment: some old hypotheses and new questions. *Clinical Psychology: Science and Practice*, 5, 314-332.
<http://dx.doi.org/10.1111/j.1468-2850.1998.tb00152.x>
- Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: are there gender differences? *Journal of Family Psychology*, 10, 45-59.
<http://dx.doi.org/10.1037/0893-3200.10.1.45>
- Deater-Deckard, K. D., & ebrary, I. (2004). *Parenting stress*. New Haven: Yale University Press.
- Denham, S. A. (1998). *Emotional development in young children*. New York: Guilford Press.
- Department of Health & Human Services, S. o. V. (2007). *Families where a parent has a mental illness*. Victoria, Melbourne: Victorian Government Department of Human Services.
- Dette-Hagenmeyer, D. E., & Reichle, B. (2014). Parents' depressive symptoms and children's adjustment over time are mediated by parenting, but differentially for fathers and mothers. *European Journal of Developmental Psychology*, 11, 196-210.
<http://dx.doi.org/10.1080/17405629.2013.848789>
- Centre for Reviews and Dissemination (2009). *Systematic Reviews: CRD's guidance for undertaking reviews in health care*. York: University of York.
- Childrens Defense Fund (2011). *Zero to three – Research to policy project. Maternal depression and early childhood*. Minnesota.
- Darwin, Z., Galdas, P., Hinchliff, S., Littlewood, E., McMillan, D., McGowan, L., . . . Bred in Yorkshire, t. (2017). Fathers' views and experiences of their own mental health during pregnancy and the first postnatal year: A qualitative interview study of men participating in the UK Born and Bred in Yorkshire (BaBY) cohort. *BMC Pregnancy and Childbirth*, 17. <http://dx.doi.org/10.1186/s12884-017-1229-4>

- Doering, L. V., Moser, D. K., & Dracup, K. (2000). Correlates of anxiety, hostility, depression, and psychosocial adjustment in parents of NICU infants. *Neonatal network : NN*, 19, 15.
- Downey, G. C., & Coyne, J.C. (1990). Children of Depressed Parents: An Integrative Review. *Psychological Bulletin*, 108, 50-76.
- Dudley, M., Roy, K., Kelk, N., & Bernard, D. (2001). Psychological correlates of depression in fathers and mothers in the first postnatal year. *Journal of Reproductive and Infant Psychology*, 19, 187-202. <http://dx.doi.org/10.1080/02646830120073206>
- Eaton, W. W., Muntaner, C., Smith, C., Tien, A., & Ybarra, M. (2004). Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (pp. 363-377): Lawrence Erlbaum, Mahwah, NJ.
- Edelstein, R.S., Wardecker, B.M., Chopik, W.J., Moors, A.C., Shipman, E.L., & Lin, N.J. (2015). Prenatal hormones in first-time expectant parents: Longitudinal changes and within-couple correlations. *American Journal of Human Biology*, 27, 317-325. <http://dx.doi.org/10.1002/ajhbm.22670>
- Eichler, A., Walz, L., Grunitz, J., Grimm, J., Van Doren, J., Raabe, E., . . . Moll, G. H. (2017). Children of prenatally depressed mothers: externalizing and internalizing symptoms are accompanied by reductions in specific social-emotional competencies. *Journal of Child and Family Studies*, 26, 3135-3144. <http://dx.doi.org/10.1007/s10826-017-0819-0>
- Eiden, R. D., Edwards, E. P., & Leonard, K. E. (2007). A conceptual model for the development of externalizing behavior problems among kindergarten children of alcoholic families: role of parenting and children's self-regulation. *Developmental Psychology*, 43, 1187-1201. <http://dx.doi.org/10.1037/0012-1649.43.5.1187>
- Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., . . .

- Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, 72, 1112-1134. <http://dx.doi.org/10.1111/1467-8624.00337>
- Elgar, F. J., Mills, R. S., McGrath, P. J., Waschbusch, D. A., & Brownridge, D. A. (2007). Maternal and paternal depressive symptoms and child maladjustment: the mediating role of parental behavior. *J Abnorm Child Psychol*, 35, 943-955. <http://dx.doi.org/10.1007/s10802-007-9145-0>
- Epifanio, M. S., Genna, V., De Luca, C., Roccella, M., & La Grutta, S. (2015). Paternal and maternal transition to parenthood: the risk of postpartum depression and parenting stress. *Pediatric reports*, 7, 5872-5872. <http://dx.doi.org/10.4081/pr.2015.5872>
- Epstein, N. B., Baldwin, L. M., & Bishop, D. S. (1983). The McMaster family assessment device. *Journal of Marital and Family Therapy*, 9, 171-180.
- Erikson, E. H. (1950). *Childhood and society*. New York: Norton.
- Erkoreka, L., Macías, M. I., Arrue, A., Basterreche, N., Arnaiz, A., Gordo, E., . . . González-Torres, M. A. (2016). Correlation between attachment and personality dimensions and their association to the catechol-O-methyltransferase Val158Met polymorphism. *European Psychiatry*, 33, S91-S91. <http://dx.doi.org/10.1016/j.eurpsy.2016.01.055>
- Falceto, O. G., Fernandes, C. L., Baratojo, C., & Giugliani, E. R. J. (2008). Factors associated with father involvement in infant care. *Revista de saúde pública*, 42, 1034.
- Falhberg, V. (2011). *A child's journey through placement*. London: British Association for Adoption & Fostering.
- Fava, M., Uebelacker, L. A., Alpert, J. E., Nierenberg, A. A., Pava, J. A., & Rosenbaum, J. F. (1997). Major depressive subtypes and treatment response. *Biological psychiatry*, 42, 568-576. [http://dx.doi.org/10.1016/S0006-3223\(96\)00440-4](http://dx.doi.org/10.1016/S0006-3223(96)00440-4)
- Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais, A. L. (2005). Subthreshold depression in adolescence and mental health outcomes in adulthood. *Archives of*

general psychiatry, 62, 66.

- Ferketich, S. L., & Mercer, R. T. (1995). Paternal-infant attachment of experienced and inexperienced fathers during infancy. *Nursing research*, 44, 31.
- Field, T., Healy, B., Goldstein, S., & Guthertz, M. (1990). Behavior-state matching and synchrony in mother-infant interactions of nondepressed versus depressed dyads. *Developmental Psychology*, 26, 7-14. <http://dx.doi.org/10.1037/0012-1649.26.1.7>
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1996). *Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-CV)*. Washington, D.C.: American Psychiatric Press.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition (SCID-I/P)*. New York: Biometrics Research, New York State Psychiatric Institute.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP)*. New York: Biometrics Research, New York State Psychiatric Institute.
- Fletcher, R. J., Feeman, E., Garfield, C., & Vimpani, G. (2011). The effects of early paternal depression on children's development. *MJA*, 195, 685-689. <http://dx.doi.org/10.5694/mja11.10192>
- Flora, S. R. (2004). *The power of reinforcement*. Albany: State University of New York Press.
- Forsell, Y. (2007). A three-year follow-up of major depression, dysthymia, minor depression and subsyndromal depression: results from a population-based study. *Depression and Anxiety*, 24, 62-65. <http://dx.doi.org/10.1002/da.20231>
- Frank, E., Carpenter, L. L., & Kupfer, D. J. (1988). Sex differences in recurrent depression: are there any that are significant? *American Journal of Psychiatry*, 145, 41-45. <http://dx.doi.org/10.1176/ajp.145.1.41>
- Frank, S. J., Olmsted, C. L., Wagner, A. E., Laub, C. C., Freeark, K., Breitzer, G. M., &

- Peters, J. M. (1991). Child illness, the parenting alliance, and parenting stress. *Journal of pediatric psychology, 16*, 361-371. <http://dx.doi.org/10.1093/jpepsy/16.3.361>
- Friedlander, S., Weiss, D. S., & Traylor, J. (1986). Assessing the influence of maternal depression on the validity of the Child Behavior Checklist. *Journal of abnormal child psychology, 14*, 123.
- Fulton, J. A. (1990). *Relationship of first-born child temperament and parenting stress to marital satisfaction*. (Dissertation/Thesis), ProQuest Dissertations Publishing.
Retrieved from <http://canterbury.summon.serialssolutions.com>.
- Furukawa, T. A., Azuma, H., Takeuchi, H., Kitamura, T., & Takahashi, K. (2011). 10-year course of social adjustment in major depression. *International Journal of Social Psychiatry, 57*, 501-508. <http://dx.doi.org/10.1177/0020764010371273>
- Gabriel, B., Beach, S. R. H., & Bodenmann, G. (2010). Depression, marital satisfaction and communication in couples: Investigating gender differences. *Behavior Therapy, 41*, 306-316.
- Galler, J. R., Harrison, R. H., Ramsey, F., Forde, V., & Butler, S. C. (2000). Maternal depressive symptoms affect infant cognitive development in Barbados. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 41*, 747-757.
<http://dx.doi.org/10.1017/S0021963099005910>
- García-López, C., Sarriá, E., & Pozo, P. (2016). Parental self-efficacy and positive contributions regarding autism spectrum condition: An actor-partner interdependence model. *Journal of Autism and Developmental Disorders, 46*, 2385-2398.
<http://dx.doi.org/10.1007/s10803-016-2771-z>
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical psychology review, 10*, 329-353. [http://dx.doi.org/10.1016/0272-7358\(90\)90065-I](http://dx.doi.org/10.1016/0272-7358(90)90065-I)
- Gelfand, D. M., Teti, D. M., & Radin Fox, C. E. (1992). Sources of parenting stress for

- depressed and nondepressed mothers of infants. *Journal of Clinical Child Psychology*, 21, 262-272. http://dx.doi.org/10.1207/s15374424jccp2103_8
- Genuchi, M. C., & Mitsunaga, L. K. (2015). Sex differences in masculine depression: externalizing symptoms as a primary feature of depression in men. *The Journal of Men's Studies*, 23, 243-251. <http://dx.doi.org/10.1177/1060826514561986>
- Giallo, R., Seymour, M., Matthews, J., Gavidia-Payne, S., Hudson, A., & Cameron, C. (2015). Risk factors associated with the mental health of fathers of children with an intellectual disability in Australia: Mental health of fathers. *Journal of Intellectual Disability Research*, 59, 193-207. <http://dx.doi.org/10.1111/jir.12127>
- Gilmer, W. S., Rush, A. J., Trivedi, M. H., Thase, M. E., Lesser, I., Wisniewski, S. R., . . . Zisook, S. (2007). Effect of age at onset on the course of Major Depressive Disorder. *American Journal of Psychiatry*, 164, 1539-1546. <http://dx.doi.org/10.1176/appi.ajp.2007.06101757>
- Goeke-Morey, M. C., Papp, L. M., & Cummings, E. M. (2013). Changes in marital conflict and youths' responses across childhood and adolescence: A test of sensitization. *Development and psychopathology*, 25, 241-251. <http://dx.doi.org/10.1017/S0954579412000995>
- Goldman, R. (2005). *Father involvement in their children's education*. London: NFPI.
- Goodman, J. H. (2004). Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. *Journal of Advanced Nursing*, 45, 26-35. <http://dx.doi.org/10.1046/j.1365-2648.2003.02857.x>
- Goldney, R. D., Fisher, L. J., Dal Grande, E., & Taylor, A. W. (2004). Subsyndromal depression: prevalence, use of health services and quality of life in an Australian population. *Social Psychiatry and Psychiatric Epidemiology*, 39, 293-298. <http://dx.doi.org/10.1007/s00127-004-0745-5>
- Goodman, J. H. (2008). Influences of maternal postpartum depression on fathers and on

- father–infant interaction. *Infant Mental Health Journal*, 29, 624-643.
- <http://dx.doi.org/10.1002/imhj.20199>
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of child psychology and psychiatry, and allied disciplines*, 38(5), 581-586.
- <http://dx.doi.org/10.1111/j.1469-7610.1997.tb01545.x>
- Goodman, R. (1999). The extended version of the Strengths and Difficulties Questionnaire as a guide to child psychiatric caseness and consequent burden. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40, 791-799.
- <http://dx.doi.org/10.1017/S0021963099004096>
- Goodman, S. H., Adamson, L. B., Riniti, J., & Cole, S. (1994). Mothers' expressed attitudes: associations with maternal depression and children's self-esteem and psychopathology. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33, 1265-1274.
- <http://dx.doi.org/10.1097/00004583-199411000-00007>
- Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, 14, 1-27.
- <http://dx.doi.org/10.1007/s10567-010-0080-1>
- Goodman, S. H., & Gotlib, I. H. (1999). Risk for Psychopathology in the children of depressed mothers: a developmental model for understanding mechanisms of transmission. *Psychological Review*, 106, 458-490.
- Gopalakrishnan, S. & Ganeshkumar, P. (2013). Systematic reviews and meta-analysis: Understanding the best evidence in primary healthcare. *Journal of family medicine and primary care*, 2, 9.
- Gopfert, M., Webster, J., & Seeman, M. V. (1996). *Parental psychiatric disorder: distressed parents and their families*. Cambridge;New York, NY, USA;: Cambridge University Press.

- Gotlib, I. H., & Hammen, C. L. (2009). *Handbook of depression* (2nd ed.). New York: Guilford Press.
- Gross, H. E., Shaw, D. S., Moilanen, K. L., Dishion, T. J., & Wilson, M. N. (2008). Reciprocal models of child behavior and depressive symptoms in mothers and fathers in a sample of children at risk for early conduct problems. *J Fam Psychol*, 22, 742-751. <http://dx.doi.org/10.1037/a0013514>
- Grych, J. H., & Fincham, F. D. (1993). Children's appraisals of marital conflict: initial investigations of the cognitive-contextual framework. *Child Development*, 64, 215-230. <http://dx.doi.org/10.1111/j.1467-8624.1993.tb02905.x>
- Guralnick, M. J., Hammond, M. A., Neville, B., & Connor, R. T. (2008). The relationship between sources and functions of social support and dimensions of child- and parent-related stress. *Journal of Intellectual Disability Research*, 52, 1138-1154. <http://dx.doi.org/10.1111/j.1365-2788.2008.01073.x>
- Haddad, M., & Gunn, J. (2011). *Fast facts: Depression - definitions and diagnosis* (3rd ed.). Abingdon: Health Press Limited.
- Hagen, I. H., Iversen, V. C., & Svindseth, M. F. (2016). Differences and similarities between mothers and fathers of premature children: a qualitative study of parents' coping experiences in a neonatal intensive care unit. *BMC PEDIATRICS*, 16, 92. doi:10.1186/s12887-016-0631-9
- Hanington, L., Heron, J., Stein, A., & Ramchandani, P. (2012). Parental depression and child outcomes – is marital conflict the missing link? *Child: Care, Health and Development*, 38, 520-529. <http://dx.doi.org/10.1111/j.1365-2214.2011.01270.x>
- Hansenne, M., Reggers, J., Pinto, E., Kjiri, K., Ajamier, A., & Ansseau, M. (1999). Temperament and character inventory (TCI) and depression. *Journal of Psychiatric Research*, 33, 31-36. [http://dx.doi.org/10.1016/S0022-3956\(98\)00036-3](http://dx.doi.org/10.1016/S0022-3956(98)00036-3)
- Harewood, T., Vallotton, C. D., & Brophy-Herb, H. (2017). More than just the breadwinner:

- the effects of fathers' parenting stress on children's language and cognitive development. *Infant and Child Development*, 26, n/a-n/a.
<http://dx.doi.org/10.1002/icd.1984>
- Haskett, M. E., Ahern, L. S., Ward, C. S., & Allaire, J. C. (2006). Factor structure and validity of the Parenting Stress Index-Short Form. *Journal of Clinical Child & Adolescent Psychology*, 35, 302-312. http://dx.doi.org/10.1207/s15374424jccp3502_14
- Hastings, R. P., Kovshoff, H., Ward, N. J., Espinosa, F. d., Brown, T., & Remington, B. (2005). Systems analysis of stress and positive perceptions in mothers and fathers of pre-school children with autism. *Journal of Autism and Developmental Disorders*, 35, 635-644. <http://dx.doi.org/10.1007/s10803-005-0007-8>
- Hautmann, C., Eichelberger, I., Hanisch, C., Plück, J., Walter, D., & Döpfner, M. (2015). Association between parental emotional symptoms and child antisocial behaviour: What is specific and is it mediated by parenting? *International Journal of Behavioral Development*, 39, 43-52. <http://dx.doi.org/10.1177/0165025414535120>
- Hawes, D. J., & Dadds, M. R. (2004). Australian data and psychometric properties of the Strengths and Difficulties Questionnaire. *Australian and New Zealand Journal of Psychiatry*, 38, 644-651.
- He, J.-P., Burstein, M., Schmitz, A., & Merikangas, K. R. (2013). The Strengths and Difficulties Questionnaire (SDQ): the factor structure and scale validation in U.S. adolescents. *Journal of abnormal child psychology*, 41, 583-595.
<http://dx.doi.org/10.1007/s10802-012-9696-6>
- Health Research Council of New Zealand (2010). *Guidelines for researchers on health research involving Maori*. Auckland, New Zealand: Health Research Council of New Zealand.
- Heffner, C. L. (2001). Erikson's stages of psychosocial development. Retrieved from http://allpsych.com/psychology101/social_development.html

- Hendrick, V., Altshuler, L. L., & Suri, R. (1998). Hormonal changes in the postpartum and implications for postpartum depression. *Psychosomatics*, 39, 93-101.
[http://dx.doi.org/10.1016/S0033-3182\(98\)71355-6](http://dx.doi.org/10.1016/S0033-3182(98)71355-6)
- Henricson, C., Katz, I., Mesie, J., Sandison, M., & Tunstill, J. (2001). *National mapping of family services in England and Wales*. London: National Family and Parenting Institute.
- Herbert, S. D., Harvey, E. A., Lugo-Candelas, C. I., & Breaux, R. P. (2013). Early fathering as a predictor of later psychosocial functioning among preschool children with behavior problems. *J Abnorm Child Psychol*, 41, 691-703.
<http://dx.doi.org/10.1007/s10802-012-9706-8>
- Hildingsson, I., Thomas, J., Avdelningen för, o., Fakulteten för, h., & Mittuniversitetet. (2014). Parental stress in mothers and fathers one year after birth. *Journal of Reproductive and Infant Psychology*, 32, 41-56.
<http://dx.doi.org/10.1080/02646838.2013.840882>
- Holmbeck, G., Paikoff, R., & Brooks-Gunn, J. (1995). Parenting adolescents. In M. H. Bornstein (Ed.), *Handbook of Parenting* (Vol. 1, pp. 91-118). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hong, R. Y., Tan, C. S., Lee, S. S. M., Tan, S.-H., Tsai, F.-F., Poh, X.-T., . . . Zhou, Y. (2015). Interactive effects of parental personality and child temperament with parenting and family cohesion. *Parenting*, 15, 92-118.
<http://dx.doi.org/10.1080/15295192.2015.1020143>
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, 6, 53-60.
- Horwitz, S. M., Briggs-Gowan, M. J., Storfer-Isser, A., & Carter, A. S. (2007). Prevalence, correlates, and persistence of maternal depression. *Journal of women's health* (2002),

- 16, 678-691. <http://dx.doi.org/10.1089/jwh.2006.0185>
- Hossain, Z., Field, T., Gonzalez, J., Malphurs, J., Valle, C. D., & Pickens, J. (1994). Infants of “depressed” mothers interact better with their nondepressed fathers. *Infant Mental Health Journal*, 15, 348-357. [http://dx.doi.org/10.1002/1097-0355\(199424\)15:4<348::AID-IMHJ2280150404>3.0.CO;2-Y](http://dx.doi.org/10.1002/1097-0355(199424)15:4<348::AID-IMHJ2280150404>3.0.CO;2-Y)
- Howe, T.-H., Sheu, C.-F., Wang, T.-N., & Hsu, Y.-W. (2014). Parenting stress in families with very low birth weight preterm infants in early infancy. *Research in developmental disabilities*, 35, 1748-1756. <http://dx.doi.org/10.1016/j.ridd.2014.02.015>
- Howland, R. H., Schettler, P. J., Rapaport, M. H., Mischoulon, D., Schneider, T., Fasiczka, A., . . . Nierenberg, A. A. (2008). Clinical features and functioning of patients with minor depression. *Psychotherapy and Psychosomatics*, 77, 384-389. <http://dx.doi.org/10.1159/000151519>
- Hu, L.-T., & Bentler, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1-55. <http://dx.doi.org/10.1080/10705519909540118>
- Huhtala, M., Korja, R., Lehtonen, L., Haataja, L., Lapinleimu, H., Munck, P., . . . Group, P. S. (2011). Parental psychological well-being and cognitive development of very low birth weight infants at 2 years. *Acta Paediatrica*, 100, 1555-1560. <http://dx.doi.org/10.1111/j.1651-2227.2011.02428.x>
- Huizink, A. C., Menting, B., De Moor, M. H. M., Verhage, M. L., Kunseler, F. C., Schuengel, C., & Oosterman, M. (2017). From prenatal anxiety to parenting stress: a longitudinal study. *Archives of Women's Mental Health*, 20, 663-672. <http://dx.doi.org/10.1007/s00737-017-0746-5>
- Hurley, K. D., Huscroft-D'Angelo, J., Trout, A., Griffith, A., & Epstein, M. (2014). Assessing parenting skills and attitudes: A review of the psychometrics of parenting measures.

- Journal of Child and Family Studies*, 23, 812-823. <http://dx.doi.org/10.1007/s10826-013-9733-2>
- Jacob, T., & Johnson, S. L. (2001). Sequential interactions in the parent-child communications of depressed fathers and depressed mothers. *Journal of Family Psychology*, 15, 38-52. <http://dx.doi.org/10.1037/0893-3200.15.1.38>
- Johnson, S., Wolke, D., & Marlow, N. (2008). Outcome monitoring in preterm populations: Measures and methods. *Zeitschrift für Psychologie/Journal of Psychology*, 216, 135-146. <http://dx.doi.org/10.1027/0044-3409.216.3.135>
- Johnson, S. L., & Jacob, T. (1997). Marital interactions of depressed men and women. *Journal of Consulting and Clinical Psychology*, 65, 15-23. <http://dx.doi.org/10.1037/0022-006X.65.1.15>
- Joiner, T. E., Walker, R. L., Pettit, J. W., Perez, M., & Cukrowicz, K. C. (2005). Evidence-based assessment of depression in adults. *Psychological Assessment*, 17, 267-277. <http://dx.doi.org/10.1037/1040-3590.17.3.267>
- Jokela, M., & Keltikangas-Järvinen, L. (2011). The association between low socioeconomic status and depressive symptoms depends on temperament and personality traits. *Personality and Individual Differences*, 51, 302-308. <http://dx.doi.org/10.1016/j.paid.2010.05.004>
- Judd, L. L., Rapaport, M. H., Paulus, M. P., & Brown, J. L. (1994). Subsyndromal symptomatic depression: a new mood disorder? *The Journal of clinical psychiatry*, 55 Suppl, 18.
- Kabacoff, R. I., Miller, I. W., Bishop, D. S., Epstein, N. B., & Keitner, G. I. (1990). A psychometric study of the McMaster Family Assessment Device in psychiatric, medical, and nonclinical samples. *Journal of Family Psychology*, 3, 431-439. <http://dx.doi.org/10.1037/h0080547>
- Kamalifard, M., Hasanpoor, S., Babapour Kheiroddin, J., Panahi, S., & Bayati Payan, S.

- (2014). Relationship between fathers' depression and perceived social support and stress in postpartum period. *Journal of caring sciences*, 3, 57-66.
<http://dx.doi.org/10.5681/jcs.2014.007>
- Kane, P., & Garber, J. (2004). The relations among depression in fathers, children's psychopathology, and father-child conflict: A meta-analysis. *Clin Psychol Rev*, 24, 339-360. <http://dx.doi.org/10.1016/j.cpr.2004.03.004>
- Kendall-Tackett, K. A. (2016). *Depression in new mothers*. Milton, UNKNOWN: Taylor and Francis.
- Kendler, K. S., Kuhn, J., & Prescott, C. A. (2004). The interrelationship of neuroticism, sex, and stressful life events in the prediction of episodes of major depression. *American Journal of Psychiatry*, 161, 631-636. <http://dx.doi.org/10.1176/appi.ajp.161.4.631>
- Kersh, J., Hedvat, T. T., Hauser-Cram, P., & Warfield, M. E. (2006). The contribution of marital quality to the well-being of parents of children with developmental disabilities. *Journal of Intellectual Disability Research*, 50, 883-893.
<http://dx.doi.org/10.1111/j.1365-2788.2006.00906.x>
- Kessler, R. C. & Ustun, B. (2008). *The WHO world mental health surveys. Perspectives on the epidemiology of mental disorders*. New York: Cambridge University Press.
- Kim, J.-H., Cho, M. J., Hong, J. P., Bae, J. N., Cho, S.-J., Hahm, B.-J., . . . Chang, S. M. (2015). Gender Differences in depressive symptom profile: results from nationwide general population surveys in Korea. *Journal of Korean Medical Science*, 30, 1659-1666. <http://dx.doi.org/10.3346/jkms.2015.30.11.1659>
- Klaus, M. H., Kennell, J. H., & Klaus, P. H. (1995). *Bonding*. Reading, MA: Addison-Wesley.
- Klein, D. N., Lewinsohn, P. M., Rohde, P., Seeley, J. R., & Olino, T. M. (2005). Psychopathology in the adolescent and young adult offspring of a community sample of mothers and fathers with major depression. *Psychological Medicine*, 35, 353-365.

<http://dx.doi.org/10.1017/S0033291704003587>

Knitzer, J., Theberge, S., & Johnson, K. (2008). *Reducing maternal depression and its impact on young children. Toward a Responsive Early Childhood Policy Framework.*

National Center for Children in Poverty - Columbia University.

Koestner, R., Franz, C., & Weinberger, J. (1990). The family origins of empathic concern: A 26-year longitudinal study. *Journal of Personality and Social Psychology*, 58, 709-717. <http://dx.doi.org/10.1037/0022-3514.58.4.709>

Koppel, G. T., & Kaiser, D. (2001). Fathers at the end of their rope: A brief report on fathers abandoned in the perinatal situation. *Journal of Reproductive and Infant Psychology*, 19, 249-251. <http://dx.doi.org/10.1080/02646830120073233>

Kornstein, S. G., Schatzberg, A. F., Thase, M. E., Yonkers, K. A., McCullough, J. P., Keitner, G. I., . . . Keller, M. B. (2000). Gender differences in chronic major and double depression. *Journal of affective disorders*, 60, 1-11. [http://dx.doi.org/10.1016/S0165-0327\(99\)00158-5](http://dx.doi.org/10.1016/S0165-0327(99)00158-5)

Kurstjens, S., & Wolke, D. (2001). Effects of maternal depression on cognitive development of children over the first 7 years of life. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42, 623-636. <http://dx.doi.org/10.1017/S0021963001007296>

Lamb, M. E. (2010). *The role of the father in child development* (5th ed.). Hoboken, N.J: Wiley.

Laucht, M., Treutlein, J., Blomeyer, D., Buchmann, A. F., Schmidt, B., Becker, K., . . . Banaschewski, T. (2009). Interaction between the 5-HTTLPR serotonin transporter polymorphism and environmental adversity for mood and anxiety psychopathology: evidence from a high-risk community sample of young adults. *International Journal of Neuropsychopharmacology*, 12, 737-747.

Lawrence, E., Bunde, M., Barry, R. A., Brock, R. L., Sullivan, K. T., Pasch, L. A., . . .

- Adams, E. E. (2008). Partner support and marital satisfaction: Support amount, adequacy, provision, and solicitation. *Personal Relationships, 15*, 445-463.
<http://dx.doi.org/10.1111/j.1475-6811.2008.00209.x>
- Le, Y., Fredman, S. J., & Feinberg, M. E. (2017). Parenting stress mediates the association between negative affectivity and harsh parenting: A longitudinal dyadic analysis. *Journal of Family Psychology, 31*(6), 679-688. <http://dx.doi.org/10.1037/fam0000315>
- Lee, C.-Y. S., Anderson, J. R., Horowitz, J. L., & August, G. J. (2009). Family Income and Parenting: The Role of Parental Depression and Social Support. *Family Relations, 58*(4), 417-430. <http://dx.doi.org/10.1111/j.1741-3729.2009.00563.x>
- Lee, S. J., Perron, B. E., Taylor, C. A., & Guterman, N. B. (2011). Paternal psychosocial characteristics and corporal punishment of their 3-year-old children. *Journal of Interpersonal Violence, 26*, 71-87. <http://dx.doi.org/10.1177/0886260510362888>
- Lee, Y., Fagan, J., & Chen, W.-Y. (2012). Do late adolescent fathers have more depressive symptoms than older fathers? *J Youth Adolesc, 41*, 1366-1381.
<http://dx.doi.org/10.1007/s10964-011-9717-8>
- Leigh, B., & Milgrom, J. (2008). Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC psychiatry, 8*, 24-24. <http://dx.doi.org/10.1186/1471-244X-8-24>
- Leonard, C. H., Picuch, R. E., & Cooper, B. A. (2001). Use of the Bayley Infant Neurodevelopmental Screener with low birth weight infants. *Journal of pediatric psychology, 26*, 33-40. <http://dx.doi.org/10.1093/jpepsy/26.1.33>
- Lerner, D., Adler, D. A., Chang, H., Lapitsky, L., Hood, M. Y., Perissinotto, C., . . . Rogers, W. H. (2004). Unemployment, job retention, and productivity loss among employees with depression. *Psychiatric services (Washington, D.C.), 55*, 1371.
- Lewinsohn, P. M., Olino, T. M., & Klein, D. N. (2005). Psychosocial impairment in offspring of depressed parents. *Psychological Medicine, 35*, 1493-1503.

<http://dx.doi.org/10.1017/S0033291705005350>

- Lewis, L. (2003). Identification and treatment of depression in men: Helping male patients express their feelings is part of the challenge. *Behavioral Management*, 23, 40-42.
- Liu, L., & Wang, M. (2015). Parenting stress and harsh discipline in China: The moderating roles of marital satisfaction and parent gender. *Child abuse & neglect*, 43, 73-82.
<http://dx.doi.org/10.1016/j.chiabu.2015.01.014>
- Liu, Y., Kaaya, S., Chai, J., McCoy, D. C., Surkan, P. J., Black, M. M., . . . Smith-Fawzi, M. C. (2017). Maternal depressive symptoms and early childhood cognitive development: A meta-analysis. *Psychological Medicine*, 47, 680-689.
<http://dx.doi.org/10.1017/S003329171600283X>
- Lovejoy, M. C. (1991). Maternal depression: effects on social cognition and behavior in parent-child interactions. *Journal of abnormal child psychology*, 19, 693-706.
<http://dx.doi.org/10.1007/BF00918907>
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: a meta-analytic review. *Clinical psychology review*, 20, 561.
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Scales (2nd ed.)*. Sydney: Psychology Foundation of Australia.
- Löwe, B., Kroenke, K., Herzog, W., & Gräfe, K. (2004). Measuring depression outcome with a brief self-report instrument: sensitivity to change of the Patient Health Questionnaire (PHQ-9). *Journal of affective disorders*, 81, 61-66. [http://dx.doi.org/10.1016/S0165-0327\(03\)00198-8](http://dx.doi.org/10.1016/S0165-0327(03)00198-8)
- Lucas, N., Nicholson, J. M., & Maguire, B. (2010). Parenting practices and behaviours (pp. 40-55), In *The Longitudinal Study of Australian Children Annual Statistical Report 2010*. Melbourne: Australian Institute of Family Studies.
- Luttikhuisen dos Santos, E. S., de Kieviet, J. F., Königs, M., van Elburg, R. M., & Oosterlaan, J. (2013). Predictive value of the Bayley scales of infant development on development

- of very preterm/very low birth weight children: a meta-analysis. *Early Human Development*, 89, 487-496. <http://dx.doi.org/10.1016/j.earlhumdev.2013.03.008>
- Lyons-Ruth, K., Wolfe, R., Lyubchik, A., & Steingard, R. (2002). Depressive symptoms in parents of children under age 3: Sociodemographic predictors, current correlates, and associated parenting behaviours. In N. Halfon & K. T. e. a. McLearn (Eds.), *Child rearing in America: Challenges facing parents with young children* (pp. 217-259). New York: Cambridge University Press.
- Lyons-Ruth, K., Zoll, D., Connell, D., & Grunebaum, H. U. (1986). The depressed mother and her one-year-old infant: environment, interaction, attachment, and infant development. *New directions for child development*, 34, 61.
- MacKenzie, M. J., Nicklas, E., Waldfogel, J., & Brooks-Gunn, J. (2012). Corporal punishment and child behavioural and cognitive outcomes through 5 years of age: evidence from a contemporary urban birth cohort study: corporal punishment and child outcomes through 5 years of age. *Infant and Child Development*, 21, 3-33. <http://dx.doi.org/10.1002/icd.758>
- Mackley, A. B., Locke, R. G., Spear, M. L., & Joseph, R. (2010). Forgotten parent: NICU paternal emotional response. *Advances in neonatal care*, 10, 200.
- Magovcevic, M., & Addis, M. E. (2005). linking gender-role conflict to nonnormative and self-stigmatizing perceptions of alcohol abuse and depression. *Psychology of Men & Masculinity*, 6, 127-136. <http://dx.doi.org/10.1037/1524-9220.6.2.127>
- Magovcevic, M., & Addis, M. E. (2008). The Masculine Depression Scale: Development and psychometric evaluation. *Psychology of Men & Masculinity*, 9, 117-132. <http://dx.doi.org/10.1037/1524-9220.9.3.117>
- Management, N. I. f. H. C. (2010). Identifying and treating maternal depression: Strategies and considerations for health plans. Retrieved from http://nihcm.org/pdf/FINAL_MaternalDepression6-7.pdf

- Manassis, K., Owens, M., Adam, K. S., West, M., & Sheldon-Keller, A. E. (1999). Assessing attachment: convergent validity of the adult attachment interview and the parental bonding instrument. *Australian and New Zealand Journal of Psychiatry*, 33, 559-567. <http://dx.doi.org/10.1046/j.1440-1614.1999.00560.x>
- Manning, A. N. (2012). The NICU experience: How does it affect the parents' relationship? *The Journal of perinatal & neonatal nursing*, 26, 353-357.
- Manzo, A. N., & Burke, J. M. (2000). *Increasing response rate in web-based/ internet surveys*. In: L. Gideon: Handbook of Survey Methodology for the Social Sciences. New York: Springer.
- Marchand, J. F., & Hock, E. (1998). The relation of problem behaviors in preschool children to depressive symptoms in mothers and fathers. *Journal of Genetic Psychology*, 159, 353-366.
- Marchand, J. F., Schedler, S., & Wagstaff, D.A. (2004). The role of parents' attachment orientations, depressive symptoms, and conflict behaviors in children's externalizing and internalizing behavior problems. *Early Childhood Research Quarterly*, 19, 449-462. <http://dx.doi.org/10.1016/j.ecresq.2004.07.003>
- Marchand-Reilly, J. F. (2012). The role of fathers' depressive symptoms and lax and over-reactive discipline in children's externalizing and internalizing behaviors. *Journal of Adult Development*, 19, 181-189. <http://dx.doi.org/10.1007/s10804-012-9145-3>
- Marcus, S. M., Young, E. A., Kerber, K. B., Kornstein, S., Farabaugh, A. H., Mitchell, J., . . . Rush, A. J. (2005). Gender differences in depression: Findings from the STARD study. *Journal of affective disorders*, 87, 141-150. <http://dx.doi.org/10.1016/j.jad.2004.09.008>
- Martin, L. A., Neighbors, H. W., & Griffith, D. M. (2013). The experience of symptoms of depression in men vs women: analysis of the National Comorbidity Survey Replication. *JAMA psychiatry*, 70, 1100.

- Maselko, J., Kubzansky, L., Lipsitt, L., & Buka, S. L. (2011). Mother's affection at 8 months predicts emotional distress in adulthood. *Journal of Epidemiology and Community Health*, 65, 621-625. <http://dx.doi.org/10.1136/jech.2009.097873>
- Mathai, J., Anderson, P., & Bourne, A. (2004). Comparing psychiatric diagnoses generated by the Strengths and Difficulties Questionnaire with diagnoses made by clinicians. *Australian and New Zealand Journal of Psychiatry*, 38, 639-643. <http://dx.doi.org/10.1080/j.1440-1614.2004.01428.x>
- Mattejat, F., & Remschmidt, H. (2008). The children of mentally ill parents. *Deutsches Ärzteblatt international*, 105, 413-418. <http://dx.doi.org/10.3238/arztebl.2008.0413>
- Matthey, S., Barnett, B., Howie, P., & Kavanagh, D. J. (2003). Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? *Journal of affective disorders*, 74, 139-147. [http://dx.doi.org/10.1016/S0165-0327\(02\)00012-5](http://dx.doi.org/10.1016/S0165-0327(02)00012-5)
- McHugh, M. L. (2012). Interrater reliability: the kappa statistic. *Biochemia medica*, 22, 276.
- Meadows, S. O., McLanahan, S.S., & Brooks-Gunn, J. (2007). Parental depression and anxiety and early childhood behavior problems across family types. *Journal of Marriage and Family*, 69, 1162-1177.
- McConnell, D., Breitzkreuz, R., & Savage, A. (2011). From financial hardship to child difficulties: main and moderating effects of perceived social support. *Child: Care, Health and Development*, 37, 679-691. <http://dx.doi.org/10.1111/j.1365-2214.2010.01185.x>
- Melis Yavuz, H., Selcuk, B., Corapci, F., & Aksan, N. (2017). Role of temperament, parenting behaviors, and stress on Turkish preschoolers' internalizing symptoms. *Social Development*, 26, 109-128. <http://dx.doi.org/10.1111/sode.12192>
- Mendes, A. V., Loureiro, S. R., Crippa, J. A., de Meneses Gaya, C., García-Esteve, L., & Martín-Santos, R. (2012). Mothers with depression, school - age children with depression? A systematic review. *Perspectives in Psychiatric Care*, 48, 138-148.

<http://dx.doi.org/10.1111/j.1744-6163.2011.00318.x>

- Meppelder, M., Hodes, M., Kef, S., & Schuengel, C. (2015). Parenting stress and child behaviour problems among parents with intellectual disabilities: the buffering role of resources: Parenting stress among parents with ID. *Journal of Intellectual Disability Research*, 59, 664-677. <http://dx.doi.org/10.1111/jir.12170>
- Middleton, M., Scott, S.L., & Renke, K. (2009). Parental depression, parenting behaviours, and behaviour problems in young children. *Infant and Child Development*, 18, 323-336. <http://dx.doi.org/10.1002/icd.59810.1002/icd>
- Miettunen, J., Veijola, J., Lauronen, E., Kantojärvi, L., & Joukamaa, M. (2007). Sex differences in Cloninger's temperament dimensions—a meta-analysis. *Comprehensive Psychiatry*, 48, 161-169. <http://dx.doi.org/10.1016/j.comppsy.2006.10.007>
- Ministry of Health New Zealand (2013). New Zealand Health Survey: Annual update of key findings 2012/2013 [Press release].
- Mirhosseini, H., Moosavipoor, S. A., Nazari, M. A., Dehghan, A., Mirhosseini, S., Bidaki, R., & Yazdian-Anari, P. (2015). Cognitive Behavioral Development in Children Following Maternal Postpartum Depression: A Review Article. *Electronic physician*, 7, 1673.
- Mitchell, S. J., See, H.M., Tarkow, A.K.H., Cabrera, N., Mc Fadden, K.E., & Shannon, J.D. (2007). Conducting studies with fathers: Challenges and opportunities. *Applied Development Science*, 11, 239-244.
- Molnar, B. E., Buka, S. L., & Kessler, R. C. (2001). Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. *American Journal of Public Health*, 91, 753-760. <http://dx.doi.org/10.2105/AJPH.91.5.753>
- Monroe, S. M., & Reid, M.W. (2008). Gene-environment interactions in depression research genetic polymorphisms and life-stress polyprocedures. *Psychological Science*, 19, 947-956.

- Mothander, P. R., & Moe, R. G. (2010). Self-reported depressive symptoms and parental stress in mothers and fathers who bring their infants to an infant mental health clinic. *Nordic Journal of Psychiatry*, 64, 310-316.
<http://dx.doi.org/10.3109/08039480903528138>
- Mulder, R. T., Carter, J. D., Frampton, C. M. A., & Darlow, B. A. (2014). Good two-year outcome for parents whose infants were admitted to a neonatal intensive care unit. *Psychosomatics*, 55, 613-620. <http://dx.doi.org/10.1016/j.psych.2013.12.007>
- Murphy, G. E. (1998). Why women are less likely than men to commit suicide. *Comprehensive Psychiatry*, 39, 165-175. [http://dx.doi.org/10.1016/S0010-440X\(98\)90057-8](http://dx.doi.org/10.1016/S0010-440X(98)90057-8)
- Musser, A. K., Ahmed, A. H., Foli, K. J., & Coddington, J. A. (2013). Paternal postpartum depression: What health care providers should know. *Journal of pediatric health care: Official publication of National Association of Pediatric Nurse Associates & Practitioners*, 27, 479-485. <http://dx.doi.org/10.1016/j.pedhc.2012.10.001>
- Muthén, L. K., & Muthén, B. O. (1998-2012). Mplus user's guide. Los Angeles: Muthén & Muthén.
- Muthén, L.K. (2017). Personal communication.
- Najarpourian, S., Fatehizadeh, M., Etemadi, O., Ghasemi, V., Abedi, M. R., & Bahrami, F. (2012). Personality types and marital satisfaction. *Interdisciplinary Journal of Contemporary Research In Business*, 4, 372.
- Najman, J. M., Williams, G. M., Nikles, J., Spence, S., Bor, W., O'Callaghan, M., . . . Shuttlewood, G. J. (2001). Bias influencing maternal reports of child behaviour and emotional state. *Social Psychiatry and Psychiatric Epidemiology*, 36, 186-194.
<http://dx.doi.org/10.1007/s001270170062>
- Newberger, E. H. (1999). *The men they will become: the nature and nurture of male character*. Reading, Mass: Perseus Books.

- Nishimura, A., & Ohashi, K. (2010). Risk factors of paternal depression in the early postnatal period in Japan: Risk factors of paternal postnatal depression. *Nursing & Health Sciences*, 12, 170-176. <http://dx.doi.org/10.1111/j.1442-2018.2010.00513.x>
- Nolen-Hoeksema, S., Wolfson, A., Mumme, D., & Guskin, K. (1995). Helplessness in children of depressed and nondepressed mothers. *Developmental Psychology*, 31, 377-387. <http://dx.doi.org/10.1037//0012-1649.31.3.377>
- Nomaguchi, K., & Johnson, W. (2016). Parenting stress among low-income and working-class fathers: the role of employment. *Journal of Family Issues*, 37, 1535-1557. <http://dx.doi.org/10.1177/0192513X14560642>
- Nonacs, R. M. (2005). Postpartum mood disorders. In L. S. Cohen & R. M. Nonacs (Eds.), *Mood and anxiety disorders during pregnancy and postpartum*. (pp. 1-165). Arlington, VA: American Psychiatric Publishing Inc.
- Norizan, A., & Shamsuddin, K. (2010). Predictors of parenting stress among Malaysian mothers of children with Down syndrome. *Journal of Intellectual Disability Research*, 54, 992-1003. <http://dx.doi.org/10.1111/j.1365-2788.2010.01324.x>
- Nygren, M., Carstensen, J., Ludvigsson, J., Sepa Frostell, A., Linköping, u., Institutionen för medicin och, h., . . . Östergötlands Läns, L. (2012). Adult attachment and parenting stress among parents of toddlers. *Journal of Reproductive and Infant Psychology*, 30, 289. <http://dx.doi.org/10.1080/02646838.2012.717264>
- Nyman, E., Miettunen, J., Freimer, N., Joukamaa, M., Mäki, P., Ekelund, J., . . . Paunio, T. (2011). Impact of temperament on depression and anxiety symptoms and depressive disorder in a population-based birth cohort. *Journal of affective disorders*, 131, 393-397. <http://dx.doi.org/10.1016/j.jad.2010.12.008>
- Oakley Browne, M. A., Wells, J.E., & Scott, K.M. (2006). Te Rau Hinengaro: The New Zealand Mental Health Survey. Wellington, NZ: Ministry of Health.
- Olshtain-Mann, O., & Auslander, G. K. (2008). Parents of Preterm Infants Two Months after

- Discharge from the Hospital: Are They Still at (Parental) Risk? *Health & Social Work*, 33, 299-308. <http://dx.doi.org/10.1093/hsw/33.4.299>
- Olson, S. L., Bates, J. E., & Bayles, K. (1984). Mother-infant interaction and the development of individual differences in children's cognitive competence. *Developmental Psychology*, 20, 166-179. <http://dx.doi.org/10.1037//0012-1649.20.1.166>
- Östberg, M., Hagekull, B., Medicinska och farmaceutiska, v., Institutionen för kvinnors och barns, h., Medicinska, f., & Uppsala, u. (2000). A structural modeling approach to the understanding of parenting stress. *Journal of Clinical Child Psychology*, 29, 615-625. http://dx.doi.org/10.1207/S15374424JCCP2904_13
- Ozturk, Y., Riccadonna, S., & Venuti, P. (2014). Parenting dimensions in mothers and fathers of children with Autism Spectrum Disorders. *Research in Autism Spectrum Disorders*, 8, 1295-1306. <http://dx.doi.org/10.1016/j.rasd.2014.07.001>
- Parker, G. (1989). The parental bonding instrument: Psychometric properties revised. *Psychiatric Genetics*, 4, 317-335.
- Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. *British Journal of Medical Psychology*, 52, 1-10.
- Paulson, J. F., Bazemore, S. D., Goodman, J. H., & Leiferman, J. A. (2016). The course and interrelationship of maternal and paternal perinatal depression. *Archives of Women's Mental Health*, 19, 655-663. <http://dx.doi.org/10.1007/s00737-016-0598-4>
- Peacock, S., Konrad, S., Watson, E., Nickel, D., & Muhajarine, N. (2013). Effectiveness of home visiting programs on child outcomes: A systematic review. *BMC public health*, 13, 17-17. <http://dx.doi.org/10.1186/1471-2458-13-17>
- Pielage, S., Gerlsma, C., & Schaap, C. (2000). Insecure attachment as a risk factor for psychopathology: the role of stressful events. *Clinical Psychology and Psychotherapy*, 7, 296-302.
- Pollack, W. (1998). Mourning, melancholia, and masculinity: Recognizing and treating

- depression in men. In W. P. R. Levant (Ed.), *A new psychotherapy for men* New York: Wiley.
- Ponnet, K., Wouters, E., Mortelmans, D., Pasteels, I., De Backer, C., Van Leeuwen, K., & Van Hiel, A. (2013). The influence of mothers' and fathers' parenting stress and depressive symptoms on own and partner's parent - child communication. *Family Process*, 52, 312-324. <http://dx.doi.org/10.1111/famp.12001>
- Pooler, E. E. (2011). *Comparison study: Depressed and nondepressed mothers' perceptions of their level of parenting stress and the influence on self-reported parenting style*. (Dissertation/Thesis), ProQuest Dissertations Publishing. Retrieved from <http://canterbury.summon.serialssolutions.com/>
- Potter, C., & Carpenter, J. (2008). 'Something in it for dads': getting fathers involved with Sure Start. *Early Child Development and Care*, 178, 761-772. <http://dx.doi.org/10.1080/03004430802352152>
- Provenzi, L., & Santoro, E. (2015). The lived experience of fathers of preterm infants in the Neonatal Intensive Care Unit: a systematic review of qualitative studies. *Journal of Clinical Nursing*, 24, 1784-1794. <http://dx.doi.org/10.1111/jocn.12828>
- Puckering, C. (1989). Annotation: Maternal Depression. *J Child Psychol Psychiatry*, 30, 807-817.
- Qualtrics (Producer). (2015-2016). Qualtrics. Retrieved from <http://www.qualtrics.com>
- Radloff, L. S. (1977). The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. *Applied Psychological Measurement*, 1, 385-401. <http://dx.doi.org/10.1177/014662167700100306>
- Ramchandani, P. G., O'Connor, T. G., Evans, J., Heron, J., Murray, L., & Stein, A. (2008). The effects of pre- and postnatal depression in fathers: a natural experiment comparing the effects of exposure to depression on offspring. *J Child Psychol Psychiatry*, 49, 1069-1078. <http://dx.doi.org/10.1111/j.1469-7610.2008.02000.x>

- Ramchandani, P. G., Psychogiou, L., Vlachos, H., Iles, J., Sethna, V., Netsi, E., & Lodder, A. (2011). Paternal depression: an examination of its links with father, child and family functioning in the postnatal period. *Depression and Anxiety*, 28, 471-477.
<http://dx.doi.org/10.1002/da.20814>
- Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., & Evans, J. (2008). Depression in men in the postnatal period and later child psychopathology: A population cohort study. *J Am Acad Child Adolesc Psychiatry*, 47, 390-398.
<http://dx.doi.org/10.1097/CHI.0b013e31816429c2>
- Ramchandani, P. P., L. (2009). Paternal psychiatric disorders and children's psychosocial development. *Lancet*, 374, 646-653. <http://dx.doi.org/10.1016/S0140->
- Ramchandani, P., Stein, A., Evans, J., O'Connor, T.G., & ALSPAC. (2005). Paternal depression in the postnatal period and child development: a prospective population study. *Lancet*, 365, 2201-2205. [http://dx.doi.org/10.1016/S0140-6736\(05\)66778-5](http://dx.doi.org/10.1016/S0140-6736(05)66778-5)
- Rantanen, J., Tilleman, K., Metsäpelto, R.-L., Kokko, K., & Pulkkinen, L. (2015). Longitudinal study on reciprocity between personality traits and parenting stress. *International Journal of Behavioral Development*, 39, 65-76.
<http://dx.doi.org/10.1177/0165025414548776>
- Raposa, E. M. A., Hammen, C. P. D., Brennan, P. P. D., & Najman, J. P. D. (2014). The Long-term effects of maternal depression: early childhood physical health as a pathway to offspring depression. *Journal of Adolescent Health*, 54, 88-93.
<http://dx.doi.org/10.1016/j.jadohealth.2013.07.038>
- Razmus, I. S. (1994). *Maternal adjustment to premature birth: Utilizing the Roy Adaptation Model as a theoretical framework*. (Dissertation/Thesis), ProQuest Dissertations Publishing. Retrieved from <http://canterbury.summon.serialsolutions.com/>
- Reeb, B. T., & Conger, K. J. (2009). The unique effect of paternal depressive symptoms on adolescent functioning: associations with gender and father-adolescent relationship

- closeness. *Journal of Family Psychology*, 23, 758-761.
<http://dx.doi.org/10.1037/a0016354>
- Reitman, D., Currier, R. O., & Stickle, T. R. (2002). A critical evaluation of the Parenting Stress Index-Short Form (PSI-SF) in a head start population. *Journal of clinical child and adolescent psychology : the official journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53*, 31, 384.
- Renk, K., Phares, V., & Epps, J. (1999). The relationship between parental anger and behavior problems in children and adolescents. *Journal of Family Psychology*, 13, 209-227.
<http://dx.doi.org/10.1037/0893-3200.13.2.209>
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the marlowe-crowne social desirability scale. *Journal of Clinical Psychology*, 38, 119-125.
- Rhoades, K. A., & O'Leary, S. G. (2007). Factor structure and validity of the parenting scale. *Journal of Clinical Child & Adolescent Psychology*, 36, 137-146.
<http://dx.doi.org/10.1080/15374410701274157>
- Rholes, W. S., Simpson, J. A., & Friedman, M. (2006). Avoidant attachment and the experience of parenting. *Personality and Social Psychology Bulletin*, 32, 275-285.
<http://dx.doi.org/10.1177/0146167205280910>
- Rice, S. M., Fallon, B. J., Aucote, H. M., Möller-Leimkühler, A., Treeby, M. S., & Amminger, G. P. (2015). Longitudinal sex differences of externalising and internalising depression symptom trajectories: Implications for assessment of depression in men from an online study. *International Journal of Social Psychiatry*, 61, 236-240. <http://dx.doi.org/10.1177/0020764014540149>
- Richards, D. (2011). Prevalence and clinical course of depression: A review. *Clinical psychology review*, 31, 1117-1125. <http://dx.doi.org/10.1016/j.cpr.2011.07.004>
- Ringoot, A. P., Tiemeier, H., Jaddoe, V. W. V., So, P., Hofman, A., Verhulst, F. C., & Jansen, P. W. (2015). Parental depression and child well-being: young children's self-reports

- helped addressing biases in parent reports. *Journal of clinical epidemiology*, 68, 928-938. <http://dx.doi.org/10.1016/j.jclinepi.2015.03.009>
- Risch, N., Herrell, R., Lehner, T., Liang, K.-Y., Eaves, L., Hoh, J., . . . Merikangas, K. R. (2009). Interaction Between the Serotonin Transporter Gene (5-HTTLPR), Stressful Life Events, and Risk of Depression: A Meta-analysis. *JAMA*, 301, 2462-2471. <http://dx.doi.org/10.1001/jama.2009.878>
- Robinette, R. L. (1991). The relationship between the Marlowe-Crowne Form C and the validity scales of the MMPI. *Journal of Clinical Psychology*, 47, 396-399.
- Robins, L. N., Wing, J., Wittchen, H. U., Helzer, J. E., Babor, T. F., Burke, J., . . . Towle, L. H. (1988). The Composite International Diagnostic Interview: An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Archives of general psychiatry*, 45, 1069-1077. <http://dx.doi.org/10.1001/archpsyc.1988.01800360017003>
- Rochelle, T. L., & Cheng, H. T. (2016). Parenting practices and child behaviour problems in hong kong: knowledge of effective parenting strategies, parenting stress, and child-rearing ideologies. *Child Indicators Research*, 9, 155-171. <http://dx.doi.org/10.1007/s12187-015-9311-9>
- Rodgers, A. Y. (1993). The assessment of variables related to the parenting behavior of mothers with young children. *Children and Youth Services Review*, 15, 385-402. [http://dx.doi.org/10.1016/0190-7409\(93\)90011-W](http://dx.doi.org/10.1016/0190-7409(93)90011-W)
- Rodríguez, M. R., Nuevo, R., Chatterji, S., & Ayuso-Mateos, J. L. (2012). Definitions and factors associated with subthreshold depressive conditions: a systematic review. *BMC psychiatry*, 12, 181-181. <http://dx.doi.org/10.1186/1471-244X-12-181>
- Roisman, G. I., Holland, A., Fortuna, K., Fraley, R. C., Clausell, E., & Clarke, A. (2007). The Adult Attachment Interview and self-reports of attachment style: An empirical rapprochement. *Journal of Personality and Social Psychology*, 92, 678-697.

<http://dx.doi.org/10.1037/0022-3514.92.4.678>

Safford, S. M., Alloy, L. B., & Pieracci, A. (2007). A comparison of two measures of parental behavior. *Journal of Child and Family Studies*, 16, 375-384.

<http://dx.doi.org/10.1007/s10826-006-9092-3>

Saigal, S., Stoskopf, B. L., Streiner, D. L., & Burrows, E. (2001). Physical growth and current health status of infants who were of extremely low birth weight and controls at adolescence. *Pediatrics*, 108, 407-415. <http://dx.doi.org/10.1542/peds.108.2.407>

Saisto, T., Salmela-aaro, K., Nurmi, J.-E., & Halmesmaki, E. (2008). Longitudinal study on the predictors of parental stress in mothers and fathers of toddlers. *Journal of Psychosomatic Obstetrics & Gynecology*, 29, 219-228.

<http://dx.doi.org/10.1080/01674820802000467>

Sansone, R. A., & Sansone, L. A. (2009). Early-versus late-onset dysthymia: A meaningful clinical distinction? *Psychiatry (Edgmont)*, 6, 14-17.

Santrock, J. W. (2014). *Child development* (Fourteenth ed.). New York: McGraw-Hill Education.

Schappin, R., Wijnroks, L., Uniken Venema, M. M. A. T., & Jongmans, M. J. (2013).

Rethinking stress in parents of preterm infants: A meta-analysis. *PloS one*, 8, e54992.

<http://dx.doi.org/10.1371/journal.pone.0054992>

Schulz, M. S. (2010). *Strengthening couple relationships for optimal child development: lessons from research and intervention* (1st ed.). Washington, DC: American Psychological Association.

Seah, C. K. F., & Morawska, A. (2016). When mum is stressed, is dad just as stressed? predictors of paternal stress in the first six months of having a baby. *Infant Mental Health Journal*, 37, 45-55. <http://dx.doi.org/10.1002/imhj.21546>

Seo, S., & Moon, H. (2012). Do Korean young children's daily routines and their mothers' parenting stress differ according to socioeconomic status? *Social Behavior and*

- Personality*, 40, 481-500. <http://dx.doi.org/10.2224/sbp.2012.40.3.481>
- Sethna, V., Murray, L., Netsi, E., Psychogiou, L., & Ramchandani, P. G. (2015). Paternal depression in the postnatal period and early father-infant interactions. *Parenting*, 15, 1-8. <http://dx.doi.org/10.1080/15295192.2015.992732>
- Sethna, V., Murray, L., & Ramchandani, P. G. (2012). Depressed fathers' speech to their 3-month-old infants: a study of cognitive and mentalizing features in paternal speech. *Psychological Medicine*, 42, 1-11. <http://dx.doi.org/10.1017/S0033291712000487>
- Shaw, D. S., Schonberg, M., Sherrill, J., Huffman, D., Lukon, J., Obrosky, D., & Kovacs, M. (2006). Responsivity to offspring's expression of emotion among childhood-onset depressed mothers. *Journal of Clinical Child & Adolescent Psychology*, 35, 490-503. http://dx.doi.org/10.1207/s15374424jccp3504_1
- Sheehan, G., Darlington, Y., Noller, P., & Feeney, J. (2004). Children's perceptions of their sibling relationships during parental separation and divorce. *Journal of Divorce & Remarriage*, 41, 69-94. http://dx.doi.org/10.1300/J087v41n01_05
- Sherr, L., Davé, S., Lucas, P., Senior, R., & Nazareth, I. (2006). A feasibility study on recruiting fathers of young children to examine the impact of paternal depression on child development. *Child psychiatry and human development*, 36, 295-309. <http://dx.doi.org/10.1007/s10578-005-0004-3>
- Shimoda, H., Inoue, A., Tsuno, K., & Kawakami, N. (2015). One-year test-retest reliability of a Japanese web-based version of the WHO Composite International Diagnostic Interview (CIDI) for major depression in a working population: Test-retest Reliability of Web-based CIDI Diagnosis of Depression. *International Journal of Methods in Psychiatric Research*, 24, 204-212. <http://dx.doi.org/10.1002/mpr.1437>
- Shin, J. Y., & Nhan, N. V. (2009). Predictors of parenting stress among Vietnamese mothers of young children with and without cognitive delay. *Journal of Intellectual and Developmental Disability*, 34, 17-26. <http://dx.doi.org/10.1080/13668250802690914>

- Scottish Intercollegiate Network - SIGN (2011). *SIGN 50 - A guideline developer's handbook*.
Edinburgh.
- Singer, L. T., Salvator, A., Guo, S., Collin, M., Lilien, L., & Baley, J. (1999). Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. *JAMA*, 281, 799-805. <http://dx.doi.org/10.1001/jama.281.9.799>
- Smits, I. A. M., Theunissen, M. H. C., Reijneveld, S. A., Nauta, M. H., & Timmerman, M. E. (2016). Measurement invariance of the parent version of the Strengths and Difficulties Questionnaire (SDQ) across community and clinical populations. *European Journal of Psychological Assessment*, 1-9. <http://dx.doi.org/10.1027/1015-5759/a000339>
- Snow, C. E., Van Hemel, S. B., Committee on Developmental, O., & Assessments for Young, C. (2008). *Early childhood assessment: why, what, and how*. Washington, D.C: National Academies Press.
- Soliday, E., McCluskey-Fawcett, K., & O'Brien, M. (1999). Postpartum affect and depressive symptoms in mothers and fathers. *American Journal of Orthopsychiatry*, 69, 30-38. <http://dx.doi.org/10.1037/h0080379>
- Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and Family*, 38, 15-28.
- Stadtlander, L. (2015). Paternal postpartum depression. *International Journal of Childbirth Education*, 30, 11.
- StataCorp (2015). *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.
- Statistics New Zealand (2014). Measuring the gender pay gap. Retrieved from www.stats.govt.nz
- Statistics New Zealand (2015). National population projections. Retrieved from www.stats.govt.nz
- Stewart, R. C. (2007). Maternal depression and infant growth – a review of recent evidence. *Maternal & Child Nutrition*, 3, 94-107. <http://dx.doi.org/10.1111/j.1740->

8709.2007.00088.x

- Stoneman, Z., Brody, G. H., & Burke, M. (1989). Marital quality, depression, and inconsistent parenting: relationship with observed mother-child conflict. *The American journal of orthopsychiatry*, 59, 105-117. <http://dx.doi.org/10.1111/j.1939-0025.1989.tb01639.x>
- Stoop, I. (2012). Unit Non-Response Due to Refusal (2012 ed., pp. 121-147). New York, NY: Springer New York.
- Storey, A. E., Walsh, C. J., Quinton, R. L., & Wynne-Edwards, K. E. (2000). Hormonal correlates of paternal responsiveness in new and expectant fathers. *Evolution and Human Behavior*, 21, 79-95. [http://dx.doi.org/10.1016/S1090-5138\(99\)00042-2](http://dx.doi.org/10.1016/S1090-5138(99)00042-2)
- Strömberg, R., Backlund, L. G., & Löfvander, M. (2010). A comparison between the Beck's Depression Inventory and the Gotland Male Depression Scale in detecting depression among men visiting a drop-in clinic in primary care. *Nordic Journal of Psychiatry*, 64, 258-264. <http://dx.doi.org/10.3109/08039480903511407>
- Sundström Poromaa, I., Comasco, E., Georgakis, M.K., & Skalkidou, A. (2017). Sex differences in depression during pregnancy and the postpartum period. *Journal of Neuroscience Research*, 95, 719-730.
- Surkan, P. J., Kennedy, C. E., Hurley, K. M., & Black, M. M. (2011). Maternal depression and early childhood growth in developing countries: Systematic review and meta-analysis. *Bulletin of the World Health Organization*, 89, 607. <http://dx.doi.org/10.2471/BLT.11.088187>
- Suzuki, Y., Sakurai, A., Yasuda, T., Harai, H., Kitamura, T., Takahashi, K., & Furukawa, T. A. (2003). Reliability, validity and standardization of the Japanese version of the Social Adjustment Scale-Self Report. *Psychiatry and Clinical Neurosciences*, 57, 441-446. <http://dx.doi.org/10.1046/j.1440-1819.2003.01144.x>
- Swickert, R. J., Hittner, J. B., & Foster, A. (2010). Big Five traits interact to predict perceived

- social support. *Personality and Individual Differences*, 48, 736-741.
<http://dx.doi.org/10.1016/j.paid.2010.01.018>
- Tannenbaum, L., & Forehand, R. (1994). Maternal depressive mood: the role of the father in preventing adolescent problem behaviors. *Behaviour Research and Therapy*, 32, 321-325. [http://dx.doi.org/10.1016/0005-7967\(94\)90129-5](http://dx.doi.org/10.1016/0005-7967(94)90129-5)
- Taylor, H. G., Klein, N., Minich, N. M., & Hack, M. (2001). Long-term family outcomes for children with very low birth weights. *Arch Pediatr Adolesc Med*, 155, 155.
- Tervo, R. C. (2012). Developmental and behavior problems predict parenting stress in young children with global delay. *Journal of Child Neurology*, 27, 291-296.
<http://dx.doi.org/10.1177/0883073811418230>
- Theule, J., Wiener, J., Tannock, R., & Jenkins, J. M. (2013). Parenting stress in families of children with adhd: A meta-analysis. *Journal of Emotional and Behavioral Disorders*, 21, 3-17. <http://dx.doi.org/10.1177/1063426610387433>
- O'Connor, E. E., Langer, D. A., & Thompson, M. C. (2017). Maternal depression and youth internalizing and externalizing symptomatology: Severity and chronicity of past maternal depression and current maternal depressive symptoms. *Journal of abnormal child psychology*, 45, 557-568. <http://dx.doi.org/10.1007/s10802-016-0185-1>
- Tran, T. D., Tran, T., & Fisher, J. (2013). Validation of the depression anxiety stress scales (DASS) 21 as a screening instrument for depression and anxiety in a rural community-based cohort of northern Vietnamese women. *BMC psychiatry*, 13, 24-24.
<http://dx.doi.org/10.1186/1471-244X-13-24>
- Treyvaud, K., Doyle, L. W., Lee, K. J., Roberts, G., Cheong, J. L. Y., Inder, T. E., & Anderson, P. J. (2011). Family functioning, burden and parenting stress 2 years after very preterm birth. *Early Human Development*, 87, 427-431.
<http://dx.doi.org/10.1016/j.earlhumdev.2011.03.008>
- Treyvaud, K., Doyle, L. W., Lee, K. J., Ure, A., Inder, T. E., Hunt, R. W., & Anderson, P. J.

- (2016). Parenting behavior at 2 years predicts school-age performance at 7 years in very preterm children. *Journal of Child Psychology and Psychiatry*, 57, 814-821.
<http://dx.doi.org/10.1111/jcpp.12489>
- Treyvaud, K., Lee, K. J., Doyle, L. W., & Anderson, P. J. (2014). Very preterm birth influences parental mental health and family outcomes seven years after birth. *The Journal of pediatrics*, 164, 515-521. <http://dx.doi.org/10.1016/j.jpeds.2013.11.001>
- Ulrich, I., Stopsack, M., Spitzer, C., Grabe, H. J., Freyberger, H. J., & Barnow, S. (2011). Familial transmission of depression: the importance of harm avoidance. *Der Nervenarzt*, 82, 1169.
- Underwood, L., Waldie, K. E., Peterson, E., D'Souza, S., Verbiest, M., McDaid, F., & Morton, S. (2017). Paternal depression symptoms during pregnancy and after childbirth among participants in the Growing Up in New Zealand study. *JAMA Psychiatry*. <http://dx.doi.org/10.1001/jamapsychiatry.2016.4234>
- Underwood, L., Waldie, K. E., D'Souza, S., Peterson, E. R., & Morton, S. M. B. (2017). A Longitudinal Study of Pre-pregnancy and Pregnancy Risk Factors Associated with Antenatal and Postnatal Symptoms of Depression: Evidence from Growing Up in New Zealand. *Maternal and Child Health Journal*, 21, 915-931.
<http://dx.doi.org/10.1007/s10995-016-2191-x>
- van Bakel, H. J. A., & Riksen-Walraven, J. M. (2002). Parenting and development of one-year-olds: links with parental, contextual, and child characteristics. *Child Development*, 73, 256-273. <http://dx.doi.org/10.1111/1467-8624.00404>
- van Batenburg-Eddes, T., Brion, M. J., Henrichs, J., Jaddoe, V. W., Hofman, A., Verhulst, F. C., . . . Tiemeier, H. W. (2013). Parental depressive and anxiety symptoms during pregnancy and attention problems in children: a cross-cohort consistency study. *Journal of Child Psychology and Psychiatry*, 54, 591-600.
<http://dx.doi.org/10.1111/jcpp.12023>

- Van Dam, N. T., & Earleywine, M. (2011). Validation of the Center for Epidemiologic Studies Depression Scale—Revised (CESD-R): Pragmatic depression assessment in the general population. *Psychiatry Research, 186*, 128-132.
<http://dx.doi.org/10.1016/j.psychres.2010.08.018>
- van Roekel, E., Engels, R. C., Verhagen, M., Goossens, L., & Scholte, R. H. (2011). Parental depressive feelings, parental support, and the serotonin transporter gene as predictors of adolescent depressive feelings: a latent growth curve analysis. *J Youth Adolesc, 40*, 453-462. <http://dx.doi.org/10.1007/s10964-010-9560-3>
- Van Steijn, D. J., Oerlemans, A. M., Van Aken, M. A. G., Buitelaar, J. K., & Rommelse, N. N. J. (2014). The reciprocal relationship of ASD, ADHD, depressive symptoms and stress in parents of children with ASD and/or ADHD. *Journal of Autism and Developmental Disorders, 44*, 1064.
- Vasquez, K., Durik, A. M., & Hyde, J. S. (2002). Family and work: implications of adult attachment styles. *Personality and Social Psychology Bulletin, 28*, 874-886.
<http://dx.doi.org/10.1177/01467202028007002>
- Velders, F. P., Dieleman, G., Henrichs, J., Jaddoe, V. W., Hofman, A., Verhulst, F. C., . . . Tiemeier, H. (2011). Prenatal and postnatal psychological symptoms of parents and family functioning: the impact on child emotional and behavioural problems. *Eur Child Adolesc Psychiatry, 20*, 341-350. <http://dx.doi.org/10.1007/s00787-011-0178-0>
- Verma, R. P., Sridhar, S., & Spitzer, A. R. (2003). Continuing care of NICU graduates. *Clinical Pediatrics, 42*, 299-315. <http://dx.doi.org/10.1177/000992280304200403>
- Vermaes, I. P. R., Janssens, J. M. A. M., Mullaart, R. A., Vinck, A., & Gerris, J. R. M. (2008). Parents personality and parenting stress in families of children with spina bifida. *Child: Care, Health and Development, 34*, 665-674.
<http://dx.doi.org/10.1111/j.1365-2214.2008.00868.x>
- Vespa, A., Ottaviani, M., Fossati, A., Giulietti, M. V., Spatuzzi, R., Meloni, C., . . . Cloninger,

- R. C. (2015). Validation of the Italian translation of the Revised Temperament and Character Inventory--TCI-140--in adult participants and in participants with medical diseases. *Comprehensive Psychiatry*, 59, 129-134.
<http://dx.doi.org/10.1016/j.comppsy.2014.12.006>
- Vismara, L., Rollè, L., Agostini, F., Sechi, C., Fenaroli, V., Molgora, S., . . . Tambelli, R. (2016). Perinatal Parenting Stress, Anxiety, and Depression Outcomes in First-Time Mothers and Fathers: A 3- to 6-Months Postpartum Follow-Up Study. *Frontiers in psychology*, 7, 938. <http://dx.doi.org/10.3389/fpsyg.2016.00938>
- Vogel, L. (2011). Paternal depression often unrecognised. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, 183, E1305-E1306. <http://dx.doi.org/10.1503/cmaj.109-4060>
- Vredenburg, K., Krames, L., & Flett, G. L. (1986). Sex differences in the clinical expression of depression. *Sex Roles*, 14, 37-49. <http://dx.doi.org/10.1007/BF00287846>
- Wålinder, J., & Rutz, W. (2001). Male depression and suicide. *International clinical psychopharmacology*, 16 Suppl 2, S21.
- Wanamaker, C. E., & Glenwick, D. S. (1998). Stress, coping, and perceptions of child behavior in parents of preschoolers with cerebral palsy. *Rehabilitation Psychology*, 43, 297-312. <http://dx.doi.org/10.1037/0090-5550.43.4.297>
- Wang, J., Mansfield, A. K., Zhao, X., & Keitner, G. (2013). Family functioning in depressed and non-clinical control families. *International Journal of Social Psychiatry*, 59, 561-569. <http://dx.doi.org/10.1177/0020764012445260>
- Wang, J., Smailes, E., Sareen, J., Fick, G. H., Schmitz, N., & Patten, S. B. (2010). The prevalence of mental disorders in the working population over the period of global economic crisis. *Canadian journal of psychiatry. Revue canadienne de psychiatrie*, 55, 598.
- Wang, L., Wu, T., Anderson, J. L., & Florence, J. E. (2011). Prevalence and risk factors of

- maternal depression during the first three years of child rearing. *Journal of Women's Health*, 20, 711-718. <http://dx.doi.org/10.1089/jwh.2010.2232>
- Wang, R., & Bianchi, S.M. (2009). ATUS fathers' involvement in childcare. *Soc Indic Res*, 93, 141-145. <http://dx.doi.org/10.1007/s11205-008-9387-4>
- Wanless, S. B., Rosenkoetter, S. E., & McClelland, M. M. (2008). Paternal depression and infant cognitive development: Implications for research and intervention. *Infants & Young Children*, 21, 134-141. <http://dx.doi.org/10.1097/01.IYC.0000314484.46958.e4>
- Webster, R. I., Majnemer, A., Platt, R. W., & Shevell, M. I. (2008). Child health and parental stress in school-age children with a preschool diagnosis of developmental delay. *Journal of Child Neurology*, 23, 32-38. <http://dx.doi.org/10.1177/0883073807307977>
- Webster-Stratton, C. (1990). Stress: A potential disruptor of parent perceptions and family interactions. *Journal of Clinical Child Psychology*, 19, 302-312. http://dx.doi.org/10.1207/s15374424jccp1904_2
- Wechsler, D. (2014). *Wechsler Intelligence Scale for Children-Fifth Edition* (Vol. 5). MN: Pearson.
- Wee, K. Y., Skouteris, H., Pier, C., Richardson, B., & Milgrom, J. (2011). Correlates of ante- and postnatal depression in fathers: a systematic review. *J Affect Disord*, 130, 358-377. <http://dx.doi.org/10.1016/j.jad.2010.06.019>
- Weinfield, N. S., Ingerksi, L., & Moreau, S.C. (2009). Maternal and paternal depressive symptoms as predictors of toddler adjustment. *J Child Fam Stud*, 18, 39-47. <http://dx.doi.org/10.1007/s10826-008-9205-2>
- Weissman, M. M., & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. *Archives of general psychiatry*, 33, 1111-1115. <http://dx.doi.org/10.1001/archpsyc.1976.01770090101010>
- Weitlauf, A. S., Vehorn, A. C., Taylor, J. L., & Warren, Z. E. (2014). Relationship satisfaction, parenting stress, and depression in mothers of children with autism.

- Autism*, 18, 194-198. <http://dx.doi.org/10.1177/1362361312458039>
- Weitzman, M., Rosenthal, D. G., & Liu, Y. H. (2011). Paternal depressive symptoms and child behavioral or emotional problems in the United States. *Pediatrics*, 128, 1126-1134. <http://dx.doi.org/10.1542/peds.2010-3034>
- Welner, Z. R., & Rice, J. (1988). School-aged children of depressed parents: a blind and controlled study. *Journal of affective disorders*, 15, 291-302.
- White, J. M., Brotherson, S. E., Galovanc, A. M., Holmes, E. K., & Kampmann, J. A. (2011). The Dakota father friendly assessment: Measuring father friendliness in head start and similar settings. *Fathering*, 9, 22-43. <http://dx.doi.org/10.3149/fth.0901.22>
- Widom, C. S., DuMont, K., & Czaja, S. J. (2007). A prospective investigation of major depressive disorder and comorbidity in abused and neglected children grown up. *Archives of general psychiatry*, 64, 49.
- Wilhelm, K. A. Y., Niven, H., Parker, G., & Hadzi-Pavlovic, D. (2005). The stability of the Parental Bonding Instrument over a 20-year period. *Psychological Medicine*, 35, 387-393. <http://dx.doi.org/10.1017/S0033291704003538>
- Williams, D. T., & Cheadle, J. E. (2016). Economic Hardship, Parents Depression, and Relationship Distress among Couples With Young Children. *Society and Mental Health*, 6, 73-89. <http://dx.doi.org/10.1177/2156869315616258>
- Willinger, U., Diendorfer-Radner, G., Willnauer, R., Jörgl, G., & Hager, V. (2005). Parenting stress and parental bonding. *Behavioral Medicine*, 31, 63-72. <http://dx.doi.org/10.3200/BMED.31.2.63-72>
- Wilson, S., & Durbin, C. E. (2010). Effects of paternal depression on fathers' parenting behaviors: a meta-analytic review. *Clin Psychol Rev*, 30, 167-180. <http://dx.doi.org/10.1016/j.cpr.2009.10.007>
- Woerner, W., Fleitlich-Bilyk, B., Martinussen, R., Fletcher, J., Cucchiaro, G., Dalgalarrrondo, P., . . . Tannock, R. (2004). The Strengths and Difficulties Questionnaire overseas:

- Evaluations and applications of the SDQ beyond Europe. *Eur Child Adolesc Psychiatry*, 13(S2), ii47-ii54. <http://dx.doi.org/10.1007/s00787-004-2008-0>
- Woodworth, S., Belsky, J., & Crnic, K. (1996). The determinants of fathering during the child's second and third years of life: A developmental analysis. *Journal of Marriage and Family*, 58, 679-692.
- World Health Organization (1993). *The ICD-10 classification of mental and behavioural disorders: diagnostic criteria for research*. Geneva: World Health Organization.
- World Health Organization (2004). *Prevention of mental disorders*. Geneva: World Health Organization.
- World Health Organization (2012). Depression. Retrieved from http://www.who.int/mental_health/management/depression/en/
- World Health Organization (2016). Depression [Fact sheet]. . Retrieved from <http://www.who.int/mediacentre/factsheets/fs369/en/>
- World Health Organization (2017). WHO WMH-CIDI Training. Retrieved from <https://www.hcp.med.harvard.edu/wmhcid/who-wmh-cidi-training/>
- Yang, C. H., Du, Y.-S., Wen-Wen, L., & Kutcher, S. (2016). Original Article: Depressive symptoms and their correlates in parents of children with autism spectrum disorders. *International Journal of Clinical Experimental Medicine*, 9, 5135-5143.
- Zanarini, M. C., & Frankenburg, F. R. (2001). Attainment and maintenance of reliability of axis I and II disorders over the course of a longitudinal study. *Comprehensive Psychiatry*, 42, 369-374. <http://dx.doi.org/10.1053/comp.2001.24556>
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica Scandinavica*, 67, 361.
- Zohar, A. H., & Cloninger, C. R. (2011). The Psychometric Properties of the TCI-140 in Hebrew. *European Journal of Psychological Assessment*, 27, 73-80. <http://dx.doi.org/10.1027/1015-5759/a000046>

Zuckerman, M. (1999). *Vulnerability to psychopathology: a biosocial model* (Vol. 1st).

Washington, DC: American Psychological Association

Appendices

Appendix A – Survey Part 1: Study 2

Note: To reduce the length of this work, the SDQ is only presented for one child and one age group in the following. The questions for the second child (if applicable) were identical. There were only minor differences between the age bands of the SDQ.

- Information sheet (Appendix B)
- Consent form (Appendix C)

In the first part of the study we will ask you some questions concerning you and your well-being

SDS S-F (Reynolds, 1982)

It is sometimes hard for me to go on with my work if I am not encouraged.

- ☐ True
- ☐ False

I sometimes feel resentful when I don't get my way.

- ☐ True
- ☐ False

On a few occasions, I have given up doing something because I thought too little of my ability.

- ☐ True
- ☐ False

There have been times when I felt like rebelling against people in authority even though I knew they were right.

- ☐ True
- ☐ False

No matter who I'm talking to, I'm always a good listener.

- ☐ True
- ☐ False

There have been occasions when I took advantage of someone.

- ☐ True
- ☐ False

I'm always willing to admit it when I make a mistake.

- ☐ True
- ☐ False

I sometimes try to get even rather than forgive and forget.

- ☐ True
- ☐ False

I am always courteous, even to people who are disagreeable.</P>

- ☐ True
- ☐ False

I have never been irked when people expressed ideas very different from my own.

- ☐ True
- ☐ False

There have times when I was quite jealous of the good fortune of others.

- ☐ True
- ☐ False

I am sometimes irritated by people who ask favors of me.

- ☐ True
- ☐ False

I have never deliberately said something that hurt someone's feelings.

- ☐ True
- ☐ False

AS-DASS21 (Lovibond & Lovibond, 1995)

Please read each statement and tick a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows:

0 Did not apply to me at all – NEVER

1 Applied to me to some degree, or some of the time – SOMETIMES

2 Applied to me to a considerable degree, or a good part of time – OFTEN

3 Applied to me very much, or most of the time - ALMOST ALWAYS

	0	1	2	3
I was aware of dryness of my mouth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I experienced trembling (eg, in the hands)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was worried about situations in which I might panic and make a fool of myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt I was close to panic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt scared without any good reason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CESD-R (Eaton et al., 2004) mod.

Below you will find a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week. Please tick one box for each statement.

	Rarely or none of the time (less than 1 day)	Some or little of the time (1-2 days)	Occasionally or a moderate amount or time (3-4 days)	Most or all of the time (5-7 days)	Nearly every day for 2 weeks
My appetite was poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not shake off the blues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble keeping my mind on what I was doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My sleep was restless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not get going	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nothing made me happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt like a bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

person					
I lost interest in					
my usual	○	○	○	○	○
activities					

Below you will find a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week. Please tick one box for each statement.

	Rarely or none of the time (less than 1 day)	Some or little of the time (1-2 days)	Occasionally or a moderate amount or time (3-4 days)	Most or all of the time (5-7 days)	Nearly every day for 2 weeks
I slept much more than usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt like I was moving too slowly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt fidgety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wished I were dead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wanted to hurt myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was tired all the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not like myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I lost a lot of weight without trying to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had a lot of trouble getting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

to sleep					
I could not					
focus on the					
important					
things					

Below you will find a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week. Please tick one box for each statement.

	Rarely or none of the time (less than 1 day)	Some or little of the time (1-2 days)	Occasionally or a moderate amount or time (3-4 days)	Most or all of the time (5-7 days)	Nearly every day for 2 weeks
I consumed more alcohol than usually	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt stressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spent less time with friends and family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was less interested in sex than I used to be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was important for me to stay in control of my emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have thought about killing myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I spent more time at work than usually	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

Please indicate how you felt on the majority of the days in the last month. Adjust the bar further to the left if your mood was rather low or adjust it further to the right if you felt happy on most days.

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

You indicated that you experienced low mood on the majority of the days in the last month. Since when do you feel depressed or unhappy?

- ☐ 1-2 months
- ☐ 3-6 months
- ☐ up to 12 months
- ☐ more than 1 year
- ☐ several years

Have you ever been treated for depression (e.g. psychotherapy, counseling, taking medicine etc.)?

- ☐ Yes
- ☐ No

Are you currently being treated for depression?

- ☐ Yes
- ☐ No

Have you ever received treatment for a mental health disorder other than depression?

- ☐ Yes, please specify _____
- ☐ No

Do you believe your mental health affects your role as a father?

- ☐ Yes
- ☐ No

Has the mother of your child/ren ever experienced low mood?

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Most of the Time
- ☐ Always
- ☐ I don't know

Has the mother of your child/ren ever had mental health difficulties?

- ☐ Yes
- ☐ No
- ☐ I don't know

Has the mother of your child/ren ever received treatment for a mental health disorder?

- ☐ Yes
- ☐ No
- ☐ I don't know

Please enter the name of disorder that she has received treatment for

Is she currently in treatment for this mental health disorder?

- ☐ Yes
- ☐ No
- ☐ I don't know

The following questions are about your current or previous relationship with the mother of your child/ren.

Are you currently in a relationship with the mother of your child/ren?

- ☐ Yes
- ☐ No

Have you ever been in a relationship with the mother of your child/ren?

- ☐ Yes
- ☐ No

DAS (Spanier, 1976)

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and the mother of your child/ren for each item on the following list.

	Always agree	Almost always agree	Occasionally disagree	Frequently disagree	Almost always disagree	Always disagree
Handling family finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Matters of recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religious matters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrations of affection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sex relations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conventionality (correct or proper behavior)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Philosophy of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ways of dealing with parents or in-laws	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aims, goals, and things believed important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

spent together						
Making major decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Household tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leisure time interests and activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and the mother of your child/ren for each item on the following list.

	All the time	Most of the time	More often than not	Occasionally	Rarely	Never
How often do you discuss or have you considered divorce, separation, or terminating your relationship?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you or your mate leave the house after a fight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, how often do you think that things between you and your partner are going well?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you confide in your mate?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you ever regret that you married? (or lived together)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you and your partner quarrel?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you and your mate “get on each other’s nerves?”	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you kiss your mate?

- ☐ Everyday
- ☐ Almost everyday
- ☐ Occasionally
- ☐ Rarely
- ☐ Never

Do you and your mate engage in outside interests together?

- ☐ All of them
- ☐ Most of them
- ☐ Some of them
- ☐ Very few of them
- ☐ None of them

How often would you say the following events occur between you and your mate?

	Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often
Have a stimulating exchange of ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Laugh together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Calmly discuss something	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work together on a project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These are some things about which couples sometimes agree and sometime disagree. Indicate if either item below caused differences of opinions or were problems in your relationship during the past few weeks. (Check yes or no)

Being too tired for sex.

- ☐ Yes
- ☐ No

Not showing love.

- ☐ Yes
- ☐ No

The bar on the following line represents different degrees of happiness in your relationship. The middle point, “happy,” represents the degree of happiness of most relationships. Please move the bar to the point, which best describes the degree of happiness, all things considered, of your relationship.

_____ Degree of happiness in your relationship

Which of the following statements best describes how you feel about the future of your relationship?

- ☐ I want desperately for my relationship to succeed, and would go to almost any length to see that it does.
- ☐ I want very much for my relationship to succeed, and will do all I can to see that it does..
- ☐ I want very much for my relationship to succeed, and will do my fair share to see that it does.

- ☐ It would be nice if my relationship succeeded, but I can't do much more than I am doing now to help it succeed.
- ☐ It would be nice if it succeeded, but I refuse to do any more than I am doing now to keep the relationship going.
- ☐ My relationship can never succeed, and there is no more that I can do to keep the relationship going.

On the next pages you will be asked some questions considering your role as a father and your child's/children's well-being.

Do you have...

- ☐ 1 child
- ☐ 2 or more children

Please specify the number of children you have

- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ more than 5

If you have more than two children aged 2-18, please choose the youngest and oldest of your children and answer the following questions based on these children. In the following part we will refer to you children as your youngest or only child and your oldest child.

The following questions concern your youngest or only child aged 2-18yrs.

How old is your youngest child?

- ☐ 2-4
- ☐ 5-10
- ☐ 11-18

Is your youngest child...

- ☐ Male
- ☐ Female

Do you live together with your youngest child?

- ☐ Yes
- ☐ No

How often do you see your first child

- ☐ Never
- ☐ Less than Once a Month
- ☐ Once a Month
- ☐ 2-3 Times a Month
- ☐ Once a Week
- ☐ 2-3 Times a Week
- ☐ Daily

How much time are you responsible for the care of your youngest child?

_____ Percentage I am in charge of my child

How much are you engaged in your youngest child's activities?

_____ Percentage I am engaged in my child's activities

SDQ (Goodman et al. 1997, 1998)

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your youngest child's behaviour over the last six months.

	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restless, overactive, cannot stay still for long	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often complains of headaches, stomach-aches or sickness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shares readily with other children, for example toys, treats, pencils	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often loses temper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rather solitary, prefers to play alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generally well behaved, usually does what adults request	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Many worries or often seems worried	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your youngest child's behaviour over the last six months.

	Not True	Somewhat True	Certainly True
Helpful if someone is hurt, upset or feeling ill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constantly fidgeting or squirming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Has at least one good friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often fights with other children or bullies them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often unhappy, depressed or tearful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generally liked by other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easily distracted, concentration wanders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nervous or clingy in new situations, easily loses confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your youngest child's behaviour over the last six months.

	Not True	Somewhat True	Certainly True
Kind to younger children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often argumentative with adults	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Picked on or bullied by other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often volunteers to help others (parents, teachers, other children)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can stop and think things out before acting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can be spiteful to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gets along better with adults than with other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Many fears, easily scared	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good attention span, sees chores or homework through to the end	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Overall, do you think that your youngest child has difficulties in one or more of the following areas: emotions, concentration, behaviour or being able to get on with other people?

- ☐ No
- ☐ Yes, minor difficulties
- ☐ Yes, definite difficulties
- ☐ Yes, severe difficulties

How long have these difficulties been present?

- ☐ Less than a month
- ☐ 1-5 months
- ☐ 6-12 months
- ☐ Over a year

Do the difficulties upset or distress your youngest child?

- ☐ Not at all
- ☐ Only a little
- ☐ Quite a lot
- ☐ A great deal

Do the difficulties interfere with your child's everyday life in the following areas?

	Not at all	Only a little	Quite a lot	A great deal
Home Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Classroom Learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leisure Activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do the difficulties put a burden on you or the family as a whole?

- ☐ Not at all
- ☐ Only a little
- ☐ Quite a lot
- ☐ A great deal

Do you have another child aged 2-18?

- ☐ Yes
- ☐ No

The following questions concern your oldest child.

How old is your oldest child?

- ☐ 2-4
- ☐ 5-10
- ☐ 11-18

Is your oldest child...

- ☐ Male
- ☐ Female

Do you live together with your oldest child?

- ☐ Yes
- ☐ No

How often do you see your oldest child?

- ☐ Never
- ☐ Less than Once a Month
- ☐ Once a Month
- ☐ 2-3 Times a Month
- ☐ Once a Week
- ☐ 2-3 Times a Week
- ☐ Daily

How much time are you responsible for the care of your oldest child?

_____ Percentage I am in charge of my child

How much are you engaged in your oldest child's activities?

_____ Percentage I am engaged in my child's activities

SDQ (Goodman et al. 1997, 1998) (*Questionnaire same as for child number 1*)

PS (Arnold, O'Leary, Wolff, & Acker, 1993)

At one time or another, all children misbehave or do things that could be harmful, that are “wrong”, or that parents don’t like. Examples include: hitting someone, whining or complaining, damaging things, forgetting homework, leaving things lying around, lying, being over-emotional, refusing to follow requests, breaking family rules, swearing, taking other people’s things, staying out late. Parents have many different ways or styles of dealing with these types of problems. Below are items that describe some styles of parenting. For

each item, tick the the number that best describes your style of parenting during the past 2 months with your child/ren.

When my child/ren misbehave/s...

- ☐ I do something right away 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I do something about it later 7

Before I do something about a problem...

- ☐ I give my child/ren several reminders or warnings 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I use only one reminder 7

When I'm upset or under stress...

- ☐ I am picky and on my child's/children's back 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I am no more picky than usual 7

When I tell my child/ren not to do something...

- ☐ I say very little 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I say a lot 7

When my child/ren pesters me...

- ☐ I can ignore the pestering 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I can't ignore the pestering 7

For each item, tick the the number that best describes your style of parenting during the past 2 months with your child/ren.

When my child/ren misbehave/s...

- ☐ I usually get into a long argument with my child 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I don't get into an argument 7

I threaten to do things that...

- ☐ I am sure I can carry out 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I know I won't actually do 7

I am the kind of parent that...

- ☐ sets limits on what child/ren is/are allowed to do 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ lets my child/ren do whatever he or she wants 7

When my child/ren misbehave/s...

- ☐ I give my child/ren a long lecture 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ keep my talks short and to the point 7

When my child/ren misbehave/s...

- ☐ I raise my voice or yell 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I speak to my child/ren calmly 7

For each item, tick the number that best describes your style of parenting during the past 2 months with your child/ren.

If saying no doesn't work right away...

- ☐ I take some other kind of action 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I keep talking and trying to get through to my child/ren 7

When I want my child/ren to stop doing something...

- ☐ I firmly tell my child/ren to stop 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I coax or beg my child/ren to stop 7

When my child/ren is/are out of my sight...

- ☐ I often don't know what my children is/are doing 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I always have a good idea of what my child/ren is/are doing 7

After there's been a problem with my child/ren...

- ☐ I often hold a grudge 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ things get back to normal quickly 7

When we're not at home...

- ☐ I handle my child/ren the way I do at home 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I let my child/ren get away with a lot more 7

For each item, tick the the number that best describes your style of parenting during the past 2 months with your child/ren.

When my child/ren does/do something I don't like...

- ☐ I do something about it every time it happens 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I often let it go 7

When there's a problem with my child/ren...

- ☐ things build up and I do things I don't mean to do 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I do something about it later 7

When my child/ren misbehave/s, I spank, slap, grab, or hit my child/ren ...

- ☐ never or rarely 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ most of the time 7

When my child/ren doesn't/don't do what I ask...

- ☐ I often let it go or end up doing it myself 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I take some other action 7

When I give a fair threat or warning...

- ☐ I often don't carry it out 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I always do what I said 7

For each item, tick the number that best describes your style of parenting during the past 2 months with your child/ren.

If saying “No” doesn’t work...

- ☐ I take some other kind of action 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I offer my child/ren something nice so he/she will behave 7

When my child/ren misbehave/s...

- ☐ I handle it without getting upset 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I get so frustrated or angry that my child/ren can see I'm upset 7

When my child/ren misbehave/s...

- ☐ I make my child/ren tell me why he/she did it 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I say "No" or take some other action 7

When my child/ren misbehaves and then acts sorry...

- ☐ I handle the problem like I usually would 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I let it go that time 7

When my child/ren misbehave/s...

- ☐ I rarely use bad language or curse 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I almost always use bad language 7

For each item, tick the number that best describes your style of parenting during the past 2 months with your child/ren.

When I say my child/ren can't do something...

- ☐ I let my child/ren do it anyway 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I stick to what I said 7

When I have to handle a problem...

- ☐ I tell my child/ren I am sorry about it 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I don't say I am sorry 7

When my child/ren does/do something I don't like, I insult my child/ren, say mean things, or call my child/ren names...

- ☐ never or rarely 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ most of the time 7

If my child/ren talk/s back or complains when I handle a problem...

- ☐ I ignore the complaining and stick to what I said 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ I give my child/ren a talk about not complaining 7

If my child/ren get/s upset when I say "No"...

- ☐ I back down and give in to my child/ren 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6

☐ I stick to what I said 7

FAD GF (Epstein et al., 1983; 2007)

We are interested in what you perceive are your family's strengths and needs. After reading each statement below, decide if you strongly agree, agree, disagree, or strongly disagree with the statement as it reflects how you feel about your family.

	Strongly Disagree	Disagree	Agree	Strongly Agree
Planning family activities is difficult because we misunderstand each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In time of crisis we can turn to each other for support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We cannot talk to each other about sadness we feel.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individuals are accepted for what they are.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We avoid discussing our fears and concerns.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We can express feelings to each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are lots of bad feelings in the family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We feel accepted for what we are.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making decisions is a problem for our family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We are able to make decisions about how to solve problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

We don't get along well together.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We confide in each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This is your unique code. Please copy it or write it down as you will need it to finish the survey. Done? Almost there!

Now please click on this

link: http://canterbury.qualtrics.com/SE/?SID=SV_4HKJsO0LPjP8JjD

Appendix B – Survey Part 2: Study 2

Please enter the code you have been given on the last page:

Please enter your email address. We need this information to avoid people taking the survey more than once, which could lead to false results in our study. Your email address will not show up on the survey pages but only the code you have been given will be visible. Your email address will be kept separately and only I, the main researcher, can use the code to relate it to your email address. I would only do so if your survey answers raise concerns about your mental health status. In that case you would receive an email. We would also use your email address to contact you if you won the iPad Mini as a compensation for taking part in this survey. You can win the iPad no matter if you filled out all parts of the survey or not. Your email address will not be used for any other purposes, nor will it be given to third parties. As aforementioned, your details will be treated confidentially and kept separately from your survey answers. Please enter your email address here:

How old are you?

- ☐ <20
- ☐ 20-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60-64
- ☐ >64

Which ethnic group do you belong to?

- ☐ NZ European
- ☐ Maori
- ☐ Samoan
- ☐ Cook Islands Maori
- ☐ Tongan
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Other _____

Occupation: Are you currently...

- ☐ employed
- ☐ self-employed
- ☐ unemployed
- ☐ studying
- ☐ retired
- ☐ other _____

What is your highest post-school qualification?

- ☐ Diploma
- ☐ Bachelor Degree
- ☐ Postgraduate & Honours Degrees
- ☐ Masters Degree
- ☐ Doctorate Degree
- ☐ No Qualification

☐ Not elsewhere included _____

Please select the region in which you currently live:

- ☐ Northland
- ☐ Auckland
- ☐ Waikato
- ☐ Bay of Plenty
- ☐ Gisborne
- ☐ Hawke's Bay
- ☐ Taranaki
- ☐ Manawatu-Wanganui
- ☐ Wellington
- ☐ Tasman
- ☐ Nelson
- ☐ Marlborough
- ☐ West Coast
- ☐ Canterbury
- ☐ Otago
- ☐ Southland

We would like to ask for your consent to be contacted for the second part of the study if suitable. The second part will consist of a session at the University of Canterbury with you and your child/ren (interview and a play situation). You will be compensated for your participation. Consenting to be contacted does not mean that you are consenting to participate. It is your choice whether or not you choose to participate in the second study.

- ☐ I agree to be contacted
- ☐ I do not wish to be contacted

Would you like to get a summary of the key results of this study?

- ☐ Yes, please send me a summary
- ☐ No, thanks

If you have any questions about this project, you can contact the researcher Germaine Gerken (germaine.gerken@pg.canterbury.ac.nz).

If you feel the content of this survey has caused emotional distress in you, you contact the following for help:

- Lifeline Aotearoa - 0800 543 354
- Parent Help Line - 0800 568 856
- Depression Helpline - 0800 111 757
- your local GP

or you can contact the primary supervisor of this research project, Janet Carter:

Telephone: +64 3 364 2987 8090

Email: janet.carter@canterbury.ac.nz

Please click next >> to complete the survey.

We thank you for your time spent taking this survey.

Your response has been recorded.

Appendix C – Recruitment Documents: Study 2

Fathers' well-being and the well-being of their children

You are invited to take part in an online survey looking at the well-being of fathers and their children in New Zealand.



This survey will be conducted by Germaine Gerken as part of her PhD research at the University of Canterbury. This research is being carried out under the supervision of Janet Carter, Jacki Henderson and Martin Dorahy.

What are the aims of the study?

We aim to obtain more information about the mood and well-being of fathers in New Zealand. We are also interested in looking at their children's well-being.

The online survey will take 30-40min to be completed. As a compensation we offer you the chance to win an iPad Mini.

Who can participate?

You can participate if you are the biological father of at least one child aged 2-18 years that resides with you.

If you are interested in taking part and want to know more about this study please contact the researcher Germaine Gerken:

Phone: +64 3 366 7001 3086 - Email: Germaine.Gerken@pg.canterbury.ac.nz

You can also access the survey directly by entering this link in your browser:

http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD

Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD	Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD	Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD	Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD	Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD	Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD	Father&Child Study +64 3 366 7001 3086 Germaine.Gerken@pg.canterbury.ac.nz http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDDTD
--	--	--	--	--	--	--

If you are interested in taking part and want to know more about this study please contact the researcher
Germaine Gerken

Phone:

+64 3 366 7001 3086

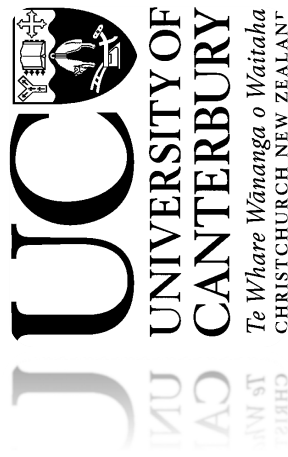
Email:

Germaine.Gerken@
pg.canterbury.ac.nz

You can also access the survey directly by entering this link in your browser:

http://canterbury.qualtrics.com/SE/?SID=SV_9zrFmfpAz5kCDTD

Or find us on Facebook:
www.facebook.com/fatherandchildstudy



*Thank you
for your
participation!*

Fathers' well-being
and the well-being
of their children

Fathers needed for
father-child study

University of Canterbury Research Project

Fathers' well-being and the well-being of their children



You are invited to take part in an online survey looking at the well-being of fathers and their children in New Zealand.

What are the aims of the study?

We aim to get more information about the mood and well-being of fathers in New Zealand. We are also interested in looking at their children's well-being.

Who can participate?

You can participate if you are the biological father of at least one child aged 2-18 years that resides with you.

The online survey will take 30-40min to be completed and you have the chance to win an iPad Mini!

This research project will be conducted by Germaine Gerken as part of her Ph.D. research project at the University of Canterbury. This project is being carried out under the supervision of Janet Carter, Jacki Henderson and Martin Dorahy.

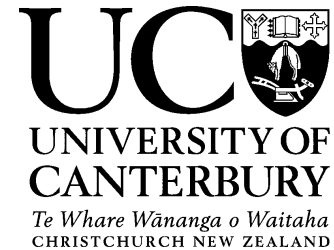
Appendix D – Information Sheet for Participants: Study 2

Psychology Department

Telephone: +64 3 366 7001 3086

Email: Germaine.Gerken@pg.canterbury.ac.nz

01/2015



Fathers' well-being and the well-being of their children

Information sheet for participants

You are invited to take part in an online survey assessing the well-being of fathers and their children in New Zealand. This survey will be conducted by Germaine Gerken as part of her PhD research at the University of Canterbury. This research is being carried out under the supervision of Associate Professor Janet Carter, Dr Jacki Henderson and Associate Professor Martin Dorahy.

What are the aims of the study?

We aim to obtain more information about the mood and well-being of fathers and their children in New Zealand. A particular focus of my research is to examine the association between depressive symptoms in fathers and their children's well-being. A further focuses of the research study involve assessing marital functioning, family functioning and discipline styles in parents. Previous studies focussing on mothers have identified a strong link between mothers' depressive symptoms and their children's well being. This finding was consequently used to improve support and treatment for mothers and children with mental health problems.

Fathers have become more involved in childcare recently and we would like to know if there is a similar association. These findings could help improving support for fathers who suffer from depressive symptoms and their children when needed.

Who can participate in this study?

If you are a NZ resident and a biological father of at least one child aged 2-18yrs that lives in your household, you may participate in this study. Your participation in this study would be completely voluntary (your choice). If you agree to take part you may withdraw at any time, for any reason without consequences.

How many participants will be involved?

We hope to study at least 400 people.

How can I participate?

You can participate by clicking >> and completing an online survey.

What will happen during the study?

You will be asked to fill out an online survey. In the survey we will ask you questions about your well-being by asking questions about your mood, sleep patterns, appetite, felt stress etc. We would also like to know more about your role as a father, your relationship to the mother of the child and some demographic questions. In terms of your child we would like to ask about hyperactivity and inattention, peer relationships, prosocial behaviour etc. We will also ask for few personal details to ensure that nobody takes the survey more than once. All the information given will be kept confidentially (see below).

Fathers from the Canterbury region will also be invited to participate in a second and related

study.

We will not invite fathers from other parts of New Zealand because the second study involves attending a session with your child at the Child Development Centre of the University of Canterbury, Christchurch, and the trip to Christchurch for an hour long session would not be reasonable

Canterbury fathers: The session at the Child Development Centre would consist of an interview and a game that you would play with your child. If you are from Canterbury you will be asked if you consent to your name being placed in a separate database so that you can be contacted in the future about the participation in the second part of the study. Consenting to be contacted does not mean that you are consenting to participate. It is your choice whether or not you choose to participate in the second study.

How much time does it take complete the survey?

You will need approximately 30-40 minutes to complete this survey.

Are there any risks of participation?

Some people may find it emotionally disturbing to talk about their well-being. Other than that, we do not foresee any risks.

If you feel the content of this survey has caused emotional distress in you, you contact the following for help:

- Lifeline Aotearoa - 0800 543 354
- Parent Help Line - 0800 568 856
- Depression Helpline - 0800 111 757
- your local GP

or you can contact the primary supervisor of this research project, Janet Carter:

Telephone: +64 3 364 2987 8090

Email: janet.carter@canterbury.ac.nz

What will happen with the information that I provide in the survey?

To ensure confidentiality any information that is gathered from participants will be kept confidential to the researcher and will be stored in a locked cabinet; electronic data will be password protected. Any identifying data will be kept separately from your survey answers.

Any published or reported results will not identify the participants.

Will I receive any compensation?

You will have the opportunity to win an iPad Mini as a compensation for your participation.

Can I get the results of this research?

You may have a summary of the key results when the study is over (approx. end of 2016).

The survey contains a question asking you specifically if you would like to get a summary of the key results.

Please contact the researcher, Germaine Gerken if you have any queries or concerns about this study:

Telephone: +64 3 366 7001 3086

Email: germaine.gerken@pg.canterbury.ac.nz

You can also contact the primary supervisor, Janet Carter.

Telephone: +64 3 364 2987 8090

Email: janet.carter@canterbury.ac.nz

Thank you for considering taking part in this study!

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

Canterbury Human Ethics Committee

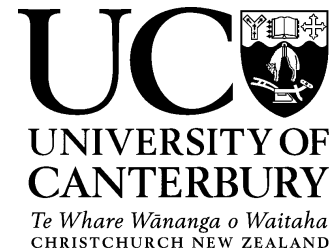
Private Bag 4800

Christchurch

human-ethics@canterbury.ac.nz

Appendix E – Consent Form: Study 2

Germaine Gerken
Psychology Department
Telephone: +64 3 366 7001 3086
Email: Germaine.Gerken@pg.canterbury.ac.nz
03/2015



Fathers' well-being and the well-being of their children

Consent form for participants

I have been given a full explanation of this project and have had the opportunity to ask questions.

I understand what is required of me if I agree to take part in the research.

I understand that participation is voluntary and I may withdraw at any time without consequences. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.

I understand that any information or opinions I provide will be kept confidential to the researcher and that any published or reported results will not identify the participants.

I understand that all data collected for the study will be kept in locked and secure facilities and/or in password protected electronic form and will be destroyed after 10 years. Any identifying data will be kept separately from my survey answers.

I understand that I am able to receive a brief report on the findings of the study.

I understand that I can contact the researcher, Germaine Gerken (Germaine.Gerken@pg.canterbury.ac.nz) or supervisor, Janet Carter (Janet.Carter@canterbury.ac.nz) for further information.

If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

By ticking the box below, I agree to participate in this research project.

I agree

I do not wish to participate

Appendix F – Additional Items For the Assessment of Paternal

Depression: Study 2

1. I consumed more alcohol than usually
2. I felt stressed
3. I spent less time with friends and family
4. I felt angry
5. I was less interested in sex than I used to be
6. It was important for me to stay in control of my emotions
7. I have thought about killing myself
8. I spent more time at work than usually

Appendix G – Article Prepared for Submission to the Journal of Child and Family Studies

Testing a Model on the Determinants of Parenting Stress: Do Fathers Differ From Mothers?

Germaine Gerken • Janet D Carter • Roger T Mulder • Joseph M Boden • Brian A Darlow • Jacki M Henderson

Running head: The determinants of parenting stress

Corresponding Author: J.D. Carter
University of Canterbury
PO Box 4800
Christchurch, New Zealand
janet.carter@canterbury.co.nz

G. Gerken • J.D. Carter • J.M. Henderson: Department of Psychology, University of Canterbury, Christchurch, New Zealand

R.T. Mulder • J.M. Boden: Department of Psychological Medicine, University of Otago, Christchurch, New Zealand

B.A. Darlow: Department of Paediatrics, University of Otago, Christchurch, New Zealand

Abstract

Parenting stress has been found to be associated with a higher use of dysfunctional parenting behaviours and poorer child functioning. Parents of children born in the neonatal intensive care unit (NICU) appear to experience particularly high levels of parenting stress. However, previous studies have typically only reported on maternal outcomes and rarely included sufficient numbers of fathers. The current study aimed to address this gap in the literature by examining levels of parenting stress comparing fathers and mothers two years after the birth of their infant. An adaptation of Belsky's model of parenting was tested via path analysis to examine the determinants of stress across parents. Participants were a random sample of parents of NICU-infants ($n = 242$) and term non-NICU infants ($n = 100$). Parents reported on parenting stress, depression and anxiety, personality, bonding, marital satisfaction and work status. The contribution of the child's birth admission status (NICU vs. control group) to stress was considered. Results showed that fathers experienced similar levels of parenting stress than mothers. The strongest predictor of paternal and maternal stress was mental health characterised by higher levels of anxiety and depressive symptoms followed by low levels of social adjustment, low marital satisfaction and unemployment. Admission of an infant to the NICU did not predict parenting stress in parents two years after birth. The results indicate that fathers and mothers experience of parenting stress is similar and at age two the child's birth admission status does not seem to affect parents stress levels anymore.

Keywords: fathers, child development, parenting, stress, model

The transition into parenthood brings many new experiences including parenting stress. Parenting stress can be defined as the experience of stress in relation to the parenting role and child rearing activities (Abidin, 1995; Haskett, Ahern, Ward, & Allaire, 2006). Stress regarding the rearing of a child often increases if the child is perceived as challenging. Parenting role stress refers to the impact child rearing can have on a parents life (Le et al., 2017). There is common agreement that not only child factors but also parental and environmental factors are likely to contribute to the development of parenting stress (Crnic & Low, 2002). Belsky's (1984) model of parenting provides an account of how parental, child and social factors are interrelated and how together they may determine the quality of parenting. Three decades later and Belsky's parenting model remains one of the key theoretical frameworks in the field that investigators employ and test in parenting research (van Bakel & Riksen-Walraven, 2002; Cardoso, Padilla, & Sampson, 2010). For example, Cardoso et al. (2010) used the model to examine the determinants of maternal parenting stress and reported that the model adequately predicted parenting stress in the majority of mothers in their sample. The researchers did not include fathers in their study.

Fathers have become much more involved in childcare over the last few decades and the benefits of this for their children, such as better social, emotional and psychological child development, have been widely demonstrated (Falceto, Fernandes, Baratojo, & Giugliani, 2008; Potter & Carpenter, 2008; White, Brotherson, Galovan, Holmes, & Kampmann, 2011). However, fathers' involvement suggests that fathers might be also more prone to parenting stress. Previous research has shown that parenting stress in mothers can severely impact their children and even lead to psychopathology (Cummings, 2000). Despite this, parenting stress in fathers is still an understudied topic and the determinants of paternal parenting stress remain unclear.

Are the levels of fathers' parenting stress different from those experienced by mothers? Studies examining levels of parenting stress in mothers and fathers showed mixed results as to whether there are gender differences. Hildingsson and Thomas (2014) noted that fathers compared to mothers seem to experience lower parenting stress levels one year after giving birth. In contrast, some studies showed that fathers reported higher levels of parenting stress than mothers (Howe, Sheu, Wang, & Hsu, 2014; Rivard, Terroux, Parent-Boursier, & Mercier, 2014). Theule, Wiener, Tannock, and Jenkins (2013) reported in their meta-analysis that fathers and mothers of children with ADHD report experiencing very similar levels of parenting stress. Similarly, Deater-Deckard and Scarr (1996) also found only minor differences in levels of parenting stress across parents.

Even if the stress levels are similar, the factors that contribute to parenting stress could be quite different in fathers and mothers (Deater-Deckard & Scarr, 1996). Researchers have suggested that spousal factors (i.e., maternal health) are likely to be a main source of fathers' parenting stress and child related factors (i.e., child's health) being predictive for mother's stress but not fathers' (Frank et al, 1991; Hastings et al., 2005). The mother as the primary caregiver often is more involved in the child's care and therefore might be more affected by the child's health status. Fathers on the other hand appear to rely more on their spouses support because they have to take over more aspects of child care if the mother is unwell or unsupportive, which can lead to increased parenting stress. In relation to Belsky's model of parenting, different parental, social and child factors will be considered that could contribute to paternal parenting stress specifically.

Belsky (1984) proposed three parental factors that may affect parenting: Parents' own developmental history, personality and psychopathology. He suggested that parents' own developmental history (e.g., parental attachment, bonding) may contribute to parenting stress via personality. Some researchers have found support for the relationship between parenting stress and attachment (e.g., Nygren, Carstensen, Ludvigsson, & Sepa Frostell, 2012) and parenting stress and bonding (Willinger, Diendorf-Radner, Willnauer, Joergl, & Hager, 2005). Willinger et al. (2005) reported that the lowest levels of parenting stress were found in parents whose bonding was characterised by a high level of care and low level of control.

Belsky (1984) emphasised that parental personality plays a critical role as a predictor of parenting attributes. Studies have found that certain personality traits are associated with higher parenting stress levels (i.e., neuroticism) and that other traits seem to function as protective factors (i.e., emotional stability) for fathers (Rantanen, Tilleman, Metsäpelto, Kokko, & Pulkkinen, 2015; Vermaes, Janssens, Mullaart, Vinck, & Gerris, 2008). The majority of research has focused on the common personality traits extraversion and neuroticism, and less on personality traits such as self-directedness and harm avoidance. High self-directedness (SD) has been associated with high functioning generally and strength to cope with any situation (Celikel et al., 2009) and thus, a high level of self-directedness may function as a protective factor for parenting stress in fathers and mothers. Harm-avoidance has been reported to be highly positively correlated with neuroticism (Jokela & Keltikangas-Järvinen, 2011). Neuroticism has been reported to be associated with utilising less effective stress coping skills (Deater-Deckard, 2004) and as aforementioned higher parenting stress levels. Individuals with high levels of harm-avoidance are also reported to experience feeling of tiredness and fatigues more easily (Cloninger, Przybeck, Svrakic, & Wetzal, 1994), which might act as a vulnerability for feeling stressed.

Parental psychopathology, such as depression, is also strongly related to an increase in parenting stress levels (e.g., Pooler, 2011). Parental role stress may be heightened in depressed fathers and mothers as they might feel that they do not have the resources or energy to fulfil these demands. In their meta-analysis Theule et al. (2013) reported that depressive symptoms were found to be the strongest predictor for parenting stress. It remains unclear whether this applies for both parents as no separate analysis by gender was performed and consequently the question remains whether these results can be replicated for fathers. The small number of research studies that included fathers in their samples could not find a significant association between paternal depression and parenting stress (Seah & Morawska, 2016) or only reported significant results for prenatal depression (Saisto, Salmela-Aro, Nurmi, & Halmesmäki, 2008). More research studies are needed to investigate this relationship.

Belsky (1984) also highlighted the impact of social factors on parenting. Marital satisfaction, for example, can be both, a risk and a protective factor for parenting stress. A positive marital relationship is likely to function as a source of support (Belsky, 1984), whereas a relationship that is marked by conflicts and dispute is likely to affect parenting negatively (Liu & Wang, 2015; Stoneman, Brody, & Burke, 1989). Deater-Deckard and Scarr (1996) noted that marital dissatisfaction was the strongest predictor of parenting stress in mothers. One domain of marital satisfaction appears to be partner support with couples perceiving their partners as more supportive reporting higher levels of marital satisfaction (Lawrence et al., 2008). Partner support might aid in tackling the demands of parenthood, such as rearing a child or coping with sleep deprivation and consequently the lack of it could lead to an increase in parenting stress. However, the research findings for the association between marital satisfaction and parenting stress are inconsistent. Liu and Wang (2015) stated that paternal parenting stress seems to be strongly related to low levels of marital satisfaction. In contrast, Theule et al. (2013) failed to find a significant link between marital dissatisfaction and high levels of parenting stress.

Social support has been widely regarded as key protective factor for parenting stress (Webster-Stratton, 1990) with greater social support being associated with lower levels of parenting stress in fathers and mothers (Deater-Deckard, 1998). Receiving support from individuals within their social network might reduce stress levels (Deater-Deckard, 1998). In addition, social support may have an indirect effect on parenting: Social support is associated with greater parental well-being, which as pointed out above appears to function as a protective factor for parenting stress (Belsky, 1984; Webster-Stratton, 1990). It is not only the quantity of

support that seems to protect parents from experiencing high levels of stress but the degree of satisfaction with the support received (Östberg and Hagekull, 2000), which is a significant aspect of social adjustment. Social adjustment measures one's satisfaction with their social situation and their adjustment. To date, it remains unclear what impact social adjustment has on parenting stress.

Belsky proposed that unemployment might negatively affect parental functioning. Researchers have found that fathers who are unemployed seem to experience higher levels of parenting stress (Nomaguchi & Johnson, 2016). The research findings are predominantly based on fathers, due to fathers often being the main economic providers and thus, unemployment may affect fathers even more than mothers. Belsky suggested in his model of parenting that unemployment and parental personality influence each other but it remains unclear, how these are meant to be related and which personality traits he believed to be associated with unemployment.

Belsky (1984) also described child characteristics and child development in his model of parenting. The contribution of having a preterm or ill infant to parenting stress over time has not been studied in depth yet. Infants admitted to the NICU are often of poorer health and at a greater risk to develop difficulties than healthy term-born infants, who do not require an admission. Parents of prematurely born infants do not only have to face the typical stressors associated with the transition to parenthood, such as sleep deprivation, hormonal changes and the adjustment to the parental role but additional significant stressors. These include fears around the infant's survival, stressors associated with the NICU environment such as the isolation from the child and concerns about their ability to care for the preterm infant after discharge from hospital (Arockiasamy, Holsti, & Albersheim, 2008; Carter, Mulder, Darlow, 2007; Olshtain-Mann, O. & Auslander, G.K., 2008). After discharge, stressors may persist as preterm born infants or any infants born in the neonatal intensive care unit (NICU) are often more demanding and require extra care compared to healthy term infants (Howe, Sheu, Wang, & Hsu, 2014). Twenty to forty per cent of very low birth weight children have medical problems that need continuing treatment (Verma, Sridhar, & Spitzer, 2003) and the infant's health issues could persist over years (Saigal, Stoskopf, Streiner, & Burrows, 2001).

Researchers comparing differences in parenting stress levels in NICU parents vs. control parents reported mixed findings with some reporting greater stress in NICU parents (Singer et al., 1999) and others showing no difference in parenting stress (Treyvaud et al., 2011). The experience and stressors associated with having a NICU infant might be different for mothers and fathers. For mothers the primary stressor appear to be

concerns about their infants' health, whereas fathers are reported to be initially more concerned about the health of their wife and experience their infants' health as a secondary stressor (e.g., Hagen, Iversen, & Svindseth, 2016). Studies also reported that a main stressor for fathers seems to be the feeling of being out of control and the lack of information given to them on both their wife's and infant's health and progress (Koppel & Kaiser, 2001; Provenzi & Santoro, 2015).

Previous studies showed some limitations with one being the very small number of fathers included in the samples under investigation, reducing the generalizability of their findings. Moreover, when including fathers, previous studies reported mixed results for mothers and fathers and to date have not examined the effect of certain variables on parenting stress such as social adjustment.

This study will examine the levels and determinants of parenting stress in fathers in a large sample and whether or not these are similar to the contributors of parenting stress in mothers. We examined stress by using an adaptation of Belsky's parenting model (see Figure 1) to examine (1) If fathers experience similar levels of parenting stress to mothers; (2) What the key determinants of parenting stress in fathers are and, (3) if the determinants of parenting stress vary between mothers and fathers.

(INSERT FIGURE 1 HERE)

Method

Participants

The study was compromised of two groups, cohabitating parents of infants who were born in the neonatal intensive unit (NICU) and a control group of cohabitating parents of full-term infants recruited from the same maternity hospital.

NICU group. Participants were parents residing in the Canterbury province who had an infant admitted to the NICU ward of the Christchurch Women's Hospital between February 2001 and February 2002. Infants were admitted to the NICU if their birth weight was lower than 1800g or if they were born before 34weeks of gestation or had any illness. Families of infants where it was known that they would go straight into foster care or adoption were not eligible to take part in the study. The sole exclusion criterion was lack of written informed consent. Fathers were included if they were cohabitating with the mother of the baby at time of birth. 296

families were randomly selected by generating a table of random numbers from the sequential admission register for the NICU in the calendar year 02/2001 - 02/2002 and invited to take part in the study. 242 families gave written informed consent (242 mothers; 205 fathers).

Control group. The control group were randomly selected families who were residing in the Canterbury province and whose infant was born full term in the Christchurch Women's Hospital but did not require admission to the NICU. Randomisation was completed by selecting every eight birth from the full term sequential admission register where admission to the NICU was not needed. 120 families were invited to participate in the study. Of these, 100 families (100 mothers, 89 fathers) agreed to take part. Fathers were included if they were cohabitating with the mothers of the baby at time of birth.

The whole sample of the present study consisted of 342 families (294 fathers and 342 mothers and their children). Demographic information can be found in Table 1. The study was approved by the Canterbury Ethics Committee (00/08/099).

(INSERT TABLE 1 HERE)

Procedure

Within three weeks of the infants' birth an experienced interviewer met each parent separately to conduct the first research assessment and the last assessment was conducted 2 years after the child's birth. The assessments consisted of a clinical interview and a set of self-report questionnaires. For this study self-reports and data from the last assessment at 2 years were utilised unless otherwise specified. We considered only total scores for all questionnaires to simplify the model, with an exemption of the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) and the Temperament and Character Inventory (TCI-144, Cloninger et al., 1994) where subscales were appropriate for the purpose of this study.

Parenting Stress

The Parenting Stress Index (Abidin, 1992) measures parenting stress by 36 items on a 5-point Likert scale. The results range from *strongly agree* to *strongly disagree*. The PSI consists of the three subscales Parental Distress (PD), Parent-Child Dysfunctional Interaction (PCDI), Difficult Child (DC) and a total stress score (Psitot), which was used in the present study. Higher scores reflect higher levels of parenting stress. The

PSI-SF has a high internal consistency, construct validity and test-re-test stability (Haskett, Ahern, Ward, & Allaire, 2006; Reitman, Currier, & Stickle, 2002). Cronbach's alpha for the total score was .83 (Haskett et al., 2006).

Parental Factors

Parental bonding. The Parental Bonding Instrument (PBI; Parker et al., 1979) assesses retrospectively how the parents in the present study experienced their own upbringing during their first 16 years of life. The PBI consists of the two scales, care and overprotection, which are assessed for both mothers and fathers. The participants rated their own parents' attitudes and behaviour in the past on 25 items as "very like", "moderately like", "moderately unlike" or "very unlike" their mother/father. An example statement would be: "Seemed emotionally cold to me". Parental bonding was assessed within the first assessment post birth. The reliability and validity of the PBI across different studies has been described as satisfactory (Parker, 1989). A more recent study reported good reliability scores ranging from .87 to .94 across the scales (Safford, Alloy, & Pieracci, 2007). Wilhelm, Heather, Parker, and Hadzi-Pavlovic (2005) reported that the PBI showed acceptable re-test stability over a 20 year period.

Parental personality. The short form of the Temperament and Character Inventory (TCI; Cloninger et al., 1994) was used to assess parental personality traits. The TCI measures temperament and character dimensions. The short-form consists of 144 "true"/"false" items like "I often feel that I am the victim of circumstances". Eight dimensions are covered on the subscales but only the following two were included in the study as they were considered as probably the most important ones for the purpose of this study: Harm avoidance (HA) and self-directedness (here SD). In contrast to the other subscales, high levels of harm avoidance and low levels of self-directedness have been reported to be associated with decreased stress coping skills and consequently might be the most relevant factors in this study on parenting stress. The TCI was administered at the first assessment post birth. The TCI has shown to have good psychometric properties with Cronbach's alpha estimated at .81 for SD and .85 for HA (Brändström et al., 1995).

Parental psychopathology. The Hospital and Anxiety Scale (HADS; Zigmond & Snaith, 1983) consists of two subscales measuring anxiety and depression on 14 items (i.e., "I feel tense or 'wound up'") with responses ranging from 0 - 3 for each item. Total scores can range from 0 to 42, with higher scores reflecting more distress. Total HADS scores were considered in the present study. We will use the term parental

psychopathology for this variable. However, it needs to be highlighted that high scores only indicate the probability of an affective disorder and not necessarily psychopathology. Bjelland and others reported in their literature review a mean of .83 for the anxiety subscale and .82 for the depression scale for Cronbach's alpha coefficient of internal consistency. They also reported a moderate to high concurrent validity with several questionnaires, such as Beck's Depression Inventory (Bjelland, Dahl, Haug, & Neckelmann, 2002).

Social Factors

Social adjustment. The Social Adjustment Scale-Self-Report (SAS-SR; Weissman & Bothwell, 1976) measures social functioning and satisfaction over the last two weeks. An example item would be "Did you depend on your relatives for help, advice, money, or friendship during the last 2 weeks?" The 45 items can be assigned to 6 major areas of functioning (i.e., parental functioning or social and leisure) and a total score which reflects overall social functioning. We used the total score in the present study. Higher scores reflect more impairment and less satisfaction. All items are designed using a 5-point Likert scale ranging from *not at all* to *all the time* and vice versa. Suzuki et al. (2003) reported that the scale obtained good reliability scores ($\alpha = .73$).

Marital functioning. To assess marital functioning Dyadic Adjustment Scale (DAS; Spanier, 1976) was used. Within 32 items (i.e., "Do you confide in your mate?") the DAS determines the degree of (dis-) satisfaction couples may experience. The four scales measure dyadic consensus, cohesion and satisfaction as well as affectional expression. A total score was considered in our study. The answers are mostly designed using a 5-6 point Likert-Scale, with only two items having a dichotomous answer format. A cut-off score of 100 was suggested by Spanier (1976) to distinguish between distressed and non-distressed couples with higher scores reflecting a better relationship. Amongst others, Carey, Spector, Lantinga, and Krauss (1993) reported a high internal consistency and stability of the DAS with Cronbach's alpha scores between .70 and .95 for the four scales and the total score.

Work. Two years after the child's birth, participants were asked whether they were currently employed or unemployed.

Child Factor

We measured the child variable as admitted to the NICU after birth ($N = 242$) or control group infant (full-term healthy infant, $N = 100$).

Data Analyses

Previous analyses yielded no significant differences between the NICU and control group at 2 years on the parental and social variables, which is consistent with previous reports of the study (Author). As a consequence we combined participants into one group with the exception of the child variable (admission status NICU born vs. control).

The data analysis was divided into two parts: In part one descriptive statistics (mean scores, standard deviations) were calculated for both mothers and fathers on all variables using SPSS 22 (IBM Corp., 2013). Mann-Whitney *U* tests were used to explore any significant differences between the two groups. In part two, we used structural equation modelling (path analysis) to test the model fit for parenting stress using Mplus 7.11 (Muthén & Muthén, 1998-2013). Personality, psychopathology, marital satisfaction, social adjustment and the child's admission status were entered as observational variables predicting parenting stress. Bonding was added to the model a predictor of personality. We also considered interrelationships between parental and social variables in the model (Figure 2). In a next step, the model goodness of fit was assessed on the basis of a number of indices including: (a) The model chi square goodness of fit statistic (χ^2). To indicate a good fit, χ^2 has to be low compared to the degrees of freedom and *p* not significant (Hooper, Coughlan, & Mullen, 2008); (b) the Root Mean Squared Error of Approximation (RMSEA). Values of RMSEA less than 0.06 are assumed to be indicative of a well-fitting model; (c) the Standardized Root Squared Residual (SRMR), which considers a model as well-fitting if the value is less than .08; and (d) The Comparative Fit Index (CFI). This index varies between 0 and 1 with values close to 1 indicating a well-fitting model (Joreskog & Sorbom, 1993).

In addition, in order to examine the extent to which intra-familial factors impacted upon the estimated model parameters for the associations, the predictors and the measure of parenting stress (which could not be tested using the MPlus Path Analysis (Muthén, 2017, personal communication)), the model described above was re-fitted using ordinary least squares mixed effects regression. In this model, within-family factors were accounted for by fitting individual slope and intercept terms for each family, with a Wald chi-square test of significance for the extent to which these factors added to the overall variance of the model.

Results

Participant Characteristics

Fathers experienced low to moderate levels of parenting stress ($M = 61.22$; $SD = 16.35$) with only 6.4% of fathers experiencing parenting stress levels over the clinical cut-off of 90. The fathers in this study experienced low levels of anxiety and depressive symptoms ($M = 5.63$; $SD = 4.72$) and reported high levels of marital satisfaction ($M = 117.94$, $SD = 13.42$).

Compared to mothers, fathers experienced similar levels of parenting stress ($U = 36229.50$, $p = .092$), but lower levels of anxiety and depression ($U = 33833.00$, $p = .001$) and lower levels of harm avoidance ($U = 23203.00$, $p < .001$). More mothers (42%, $n = 131$) than fathers (7.6%, $n = 20$) reported being unemployed. No significant gender differences were discovered for the remaining variables. Participant characteristics and gender differences are presented in Table 2.

(INSERT TABLE 2 HERE)

Path Analysis

The first test of the model revealed that the data from the PBI subscales did not significantly add to the model so the PBI data was removed from further analyses.

Model fit indices. The model fit indices can be found in Table 3. All fit indices showed a very good fit of the model across fathers and mothers. The model explained 29% of the variance in parenting stress for fathers ($R^2 = .291$, $p < .001$) and 38% of the variance for mothers ($R^2 = .378$, $p < .001$).

(INSERT TABLE 3 HERE)

Pathways of parenting stress. Psychopathology, social adjustment, marital satisfaction and work were significant predictors of paternal parenting stress. Fathers' mental health was the strongest predictor of parenting stress ($B = 0.25$, $p < .001$). No effects could be found for self-directedness, harm avoidance or the child variable (see Table 4). For mothers the same pattern was evident: Psychopathology, social adjustment, marital satisfaction and work predicted parenting stress. Mothers' mental health was also the strongest predictor of

parenting stress ($B = 0.31, p < .001$). Similarly to fathers, none of the personality variables (self-directedness and harm avoidance), nor the child's birth status appeared to contribute to mothers' parenting stress (see Table 4).

(INSERT TABLE 4)

Interrelationships of the variables. Almost all variables were significantly correlated across gender (see Table 5). The model analyses indicated the addition of two further correlations: Parental psychopathology with social adjustment, and marital satisfaction with social adjustment. These were included and the results can be seen in Table 5 and Figure 2. The strongest correlation for fathers was found between psychopathology and parenting stress and social adjustment, and marital satisfaction and social adjustment (all $r_s = .53, p < .001$). For mothers the strongest correlation was between psychopathology and social adjustment (mothers: $r_s = .57, p < .001$).

(INSERT TABLE 5 HERE AND FIGURE 2 HERE)

Test of within-family variance. As noted in Methods, it was not possible to account for the extent to which intra-familial factors may have impacted on the estimated model parameters using the procedure described above (Muthén, 2017, personal communication). In order to examine this issue, the model described above was re-fitted in an ordinary least squares mixed effects model framework using Stata 14 (StataCorp, 2015). The results of this analysis suggested that intra-familial factors did not contribute significantly to the variance accounted for by the model (Wald chi-square (3) = 4.32, $p = .12$), suggesting that the parameter estimates shown above were not unduly influenced by intra-familial factors.

Discussion

In this study an adaptation of Belsky's (1984) model of parenting was used to examine predictors of parenting stress in fathers and in mothers. The model showed a very good fit for both parents. The results indicated that fathers experienced similar levels of parenting stress than mothers. The determinants of parenting stress were paternal psychopathology, social adjustment, marital satisfaction and work for both fathers and mothers.

The strongest predictor of paternal parenting stress levels was fathers' mental health; higher anxiety and depression scores were associated with more parenting stress. There is little comparable research but those studies that considered depression in fathers as a predictor for paternal stress presented inconsistent results (Saisto et al., 2008; Seah & Morwaska, 2016). Our finding, however, is comparable to the results found for mothers. For example, Leigh and Milgrom (2008) reported that maternal depression was the strongest predictor for mothers' stress. Additional studies with large sample sizes are needed to see if this result can be replicated. Parents experiencing mental health problems might have fewer resources to handle the demands of parenthood and experience higher stress levels.

Belsky (1984) hypothesized that low marital satisfaction is a strong predictor of parenting stress. Some studies examining maternal parenting stress reported that low levels of marital satisfaction were the strongest predictor of mother's stress levels (e.g., Deater-Deckard & Scarr, 1996). Interestingly, marital satisfaction was not the strongest predictor for fathers in our study but it did significantly add to parenting stress. Consistent with Liu and Wang (2015) who reported a significant negative correlation between paternal stress and marital satisfaction, in this study lower levels of marital satisfaction were associated with higher parenting stress levels. Feeling satisfied with your relationship and experiencing it as supportive appears to keep parenting stress levels at a low.

To date, most studies investigated the quantitative aspect of social support with less support predicting higher levels of parenting stress (Cardoso et al., 2010). In contrast, this study focused on a qualitative aspect – the satisfaction with and adjustment to one's social situation and found that lower satisfaction/more impaired adjustment predicts parenting stress in fathers.

As proposed by Belsky (1984) work measured as employment vs. unemployment functioned as a determinant of parenting stress. Nomaguchi and Johnson (2016) also found a significant relationship between employment status and parenting stress; fathers who were unemployed experienced higher levels of parenting stress. However, research on this topic is scarce and more studies are needed to examine this association in more detail.

Individuals showing low levels of self-directedness have been described as aimless, inept and undisciplined (Cloninger & Svrakic, 1997). These character traits were expected to lead to an increase in

parenting stress in fathers and mothers with low self-directedness. Contrary to expectations, lower levels of self-directedness were not associated with higher levels of parenting stress in fathers, nor mothers. Despite a significant gender difference in baseline scores of harm avoidance with mothers reporting more harm-avoidance, this variable did not contribute to parenting stress in mothers or fathers either. High levels of harm-avoidance are reportedly associated with feeling easily fatigued (Coninger et al., 1994). Harm-avoidance has also been found to be highly correlated with neuroticism (e.g., Jokela & Keltikangas-Järvinen, 2011). Individuals with high neuroticism levels seem to have a higher predisposition for stress and less effective coping skills (Deater-Deckard, 2004) and consequently seem to be more prone to experience parenting stress (Rantanen et al., 2015). Perhaps surprisingly, harm-avoidance did not have this impact on parenting stress in our study. The inclusion of a variety of significant contributors of parenting stress, might have affected the impact of harm avoidance/self-directedness on parenting stress.

Belsky (1984) proposed that parents' own developmental history can contribute to parenting stress via personality. Only a few studies have studied the relationship between adult attachment and parenting stress (e.g., Nygren et al., 2012; Rholes, Simpson, & Friedman, 2006; Vasquez, Durik, & Hyde, 2002) and reported a significant association with no differences between fathers and mothers. Bonding measured as care and overprotection did not have an effect on parents' personality or parenting stress. This study differed from other studies as it measured bonding as a construct of attachment and did not divide parents into different attachment style groups but included total scores of care and overprotection as a continuous variable. It may be that only certain attachment styles predict parenting stress, which could not be examined due to the measurement approach used. Moreover, some studies have disputed whether the PBI is suitable to assess attachment (e.g., Manassis, Owens, Adam, West, & Sheldon-Keller, 1999). Consequently it can be questioned, whether bonding might have a different impact on personality and parenting stress than more traditional constructs of attachment. On the other hand side it is also possible that Belsky's path between parental bonding and personality can simply not be supported.

Preterm infants or any new born infant admitted to the neonatal intensive care unit (NICU) bring a number of on-going challenges for parents such as often being more demanding and require extra care compared to healthy term infants due to the medical concerns or conditions such as low birth weight or illness that initiated the NICU admission in the first place (Howe et al., 2014). Schappin and others showed in their meta-analysis that parents of NICU children experience more parenting stress after birth than parents of no-risk children

(Schappin, Wijnroks, Uniken Venema, & Jongmans, 2013). We expected a similar pattern in the present study, however, contrary to Belsky's hypothesis, the child's characteristics (here: NICU admission at birth vs. control) did not contribute to parenting stress. Rather, only parental and social factors were related to parenting stress and surprisingly, two years after birth, it does not seem to matter anymore whether a child was a high risk infant at birth and admitted to the NICU or not. Increased stress levels after birth in parents whose child was admitted to the NICU might be explained due to the increased uncertainty and care needed, as the need for care decreases over time and/or parents get more confident stress may decrease. Some researchers have suggested that how much parents are affected by having an infant born in the NICU depends upon the baby's medical risk status, age and developmental outcome. Previous studies reported mixed results as to whether the higher parenting stress levels in parents of preterm infants persist over time (e.g., Treyvaud et al., 2011; Treyvaud, Lee, Doyle, & Anderson, 2014). It is also to be noted that families in New Zealand do not have to pay to receive high quality NICU care and follow up care. Stress levels might be higher in countries where the family has to face the financial burden on top of the emotional burden of having an infant born prematurely.

In order to address this study's final research question, we compared mothers and fathers results to identify any potential differences. It was found that fathers experienced lower levels of anxiety and depressive symptoms but similar levels of parenting stress. Previous findings for gender differences in parenting stress levels have been mixed, whereas the finding that fathers experience lower levels of anxiety and depression is a common one (e.g., Seah & Morwaska, 2016). Consistent with previous findings (Miettunen, Veijola, Lauronen, Kontojärvi, & Joukamaa, 2007) is that mothers reported significantly more harm avoidance than fathers. Nevertheless, the predictors of parenting stress were the same for mothers and fathers. Despite explaining a slightly larger amount of variance in parenting stress for mothers, the proposed parenting stress model fit well for both parents.

This study has some limitations. The cross-sectional nature of the data limit the extents to which causal conclusions may be drawn. Also, our study was based on self-reported measures and examined only a selection of variables that could predict parenting stress. There is a significant amount of variance that could not be explained suggesting that examination of other variables is needed. For example, van Bakel and Riksen-Walraven (2002) suggested that parental education and intelligence should be added to Belsky's model. Cardoso et al. (2010) reported that the results vary across different ethnic groups. We also did not measure parents' stress levels before birth. Some authors have suggested that stress pre birth could be a strong predictor

for parenting stress post birth and at a later stage (Crnic & Low, 2002). In regard to the child's impact, only NICU admission at birth was considered as the child variable under investigation. This variable can be seen as a cluster variable presenting different factors such as child health, birth weight or preterm birth that are highly correlated with NICU status in one variable. However, some authors (e.g., van Bakel & Riksen-Walraven, 2002) have suggested that more specific domains of child development, such as the child's cognitive development could be important when assessing parents' parenting stress.

One of the strengths of this study is the inclusion of a large sample of fathers and the separate evaluation of maternal and paternal stress. Previous studies had mostly failed to either involve fathers or to clarify whether their results apply for both or just one parent. Even though some studies used Belsky's (1984) model as a theoretical foundation, very few of these had statistically tested the model as comprehensively as done here. By assessing the effects of parental personality and psychopathology separately, the individual impact on parenting stress could be studied in more depth.

In conclusion, we found that fathers experienced similar levels of parenting stress than mothers. Overall, Belsky's model was largely supported by the results and the model tested in our study explained a significant amount of parenting stress in fathers and mothers. Parenting stress was predicted by paternal psychopathology, social adjustment, marital satisfaction and work for both parents.

References

- Abidin, R.R. (1992). The determinants of parenting behavior. *Journal of Clinical Child Psychology*, 21, 407-412.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, 55, 83-96.
- Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of psychosomatic research*, 52, 69-77.
- Brändström, S., Schlette, P., Przybeck, T. R., Lundberg, M., Forsgren, T., Sigvardsson, S., . . .
Hälsouniversitetet (1998). Swedish normative data on personality using the temperament and character inventory. *Comprehensive Psychiatry*, 39, 122-128
- Cardoso, J.B., Padilla, Y.C., & Sampson, M. (2010). Racial and ethnic variation in the predictors of maternal parenting stress. *Journal of Social Service Research*, 36, 429-444.
- Carey, M. P., Spector, I. P., Lantinga, L. J., & Krauss, D. J. (1993). Reliability of the Dyadic Adjustment Scale. *Psychological Assessment*, 5, 238-240.
- Celikel, F.C., Kose, S., Cumurcu, B.E., Erkorkmaz, U., Sayar, K., Borckardt, J.J., & Cloninger, C.R. (2009). Cloninger's temperament and character dimensions of personality in patients with major depressive disorder. *Comprehensive Psychiatry*, 50, 556-561.
- Cloninger, C.R., Przybeck, T., Syrakic, D., & Wetzel, R. (1994). *The Temperament and Character Inventory (TCI). A guide to its development and use*. Missouri, USA: Centre for Psychobiology and Personality.
- Cloninger, C.R. & Svrakic, D.M. (1997). Integrative psychobiological approach to psychiatric assessment and treatment. *Psychiatry*, 60, 120-141.
- Crnic, K. & Low, C. (2002). Everyday stresses and parenting. In: M.H. Bornstein (Ed.). *Handbook of Parenting* (v.5, 2nd ed.). Lawrence Erlbaum: New Jersey, USA, pp. 243-268.
- Cummings, E. M., Davies, P., & Campbell, S. B. (2000). *Developmental psychopathology and family process: theory, research, and clinical implications*. New York: Guilford Press.
- Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice*, 5, 314-332.
- Deater-Deckard, K. (2004). *Parenting stress*. New Haven, CT: Yale University Press.
- Deater-Deckard, K. & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: Are there gender differences? *Journal of Family Psychology*, 10, 45-59.
- De Fruyt, F., van de Wiele, L., van Heeringen, C. (2000). Cloninger's psychobiological model of temperament

- and the five-factor model of personality. *Personality and Individual Differences*, 29, 441-452.
- Falceto, O.G., Fernandes, C.L., Baratojo, C., & Giugliani, E.R.J. (2008). Factors associated with father involvement in infant care. *Rev Saúde Pública*, 42, 1-6.
- Frank, S.J., Olmsted, C.L., Wagner, A.E., Laub, C.C., Freeark, K., Breitzer, G.M., & Peters, J.M. (1991). Child illness, the parenting alliance, and parenting stress. *Journal of Pediatric Psychology*, 16, 361-371.
- Hagen, I. H., Iversen, V. C., & Svindseth, M. F. (2016). Differences and similarities between mothers and fathers of premature children: a qualitative study of parents' coping experiences in a neonatal intensive care unit. *BMC PEDIATRICS*, 16, 92.
- Haskett, M. E., Ahern, L. S., Ward, C. S., & Allaire, J. C. (2006). Factor Structure and Validity of the Parenting Stress Index-Short Form. *Journal of Clinical Child & Adolescent Psychology*, 35, 302-312.
- Hastings, R.P., Kovshoff, H., Ward, N.J., degli Espinosa, F., Brown, T., & Remington, B. (2005). System analysis of stress and positive perceptions in mothers and fathers of pre-school children with autism. *Journal of Autism and Developmental Disorders*, 35, 635-644.
- Hildingsson, I. & Thomas, J. (2014). Parental stress in mothers and fathers one year after birth. *Journal of Reproductive and Infant Psychology*, 32, 41-56.
- Hooper, D., Coughlan, J., & Mullen, M.R. (2008). Structural equation modelling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, 6, 53-60.
- Howe, T.-H., Sheu, C.-F., Wang, T.-N., & Hsu, Y.-W. (2014). Parenting stress in families with very low birth weight preterm infants in early infancy. *Research in Developmental Disabilities*, 35, 1748-1756.
- Hu, L.T. & Bentler, P.M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- IBM Corp (2013). *IBM SPSS Statistics for Windows, Version 22.0*. Armonk, NY: IBM Corp.
- Jokela, M. & Keltikangas-Järvinen, L. (2011). The association between low socioeconomic status and depressive symptoms depends on temperament and personality traits. *Personality and Individual Differences*, 51, 302-308.
- Joreskog, K.G., & Sorbom, D. (1993). LISREL 8: Structural Equation Modelling with the SIMPLIS command language. Retrieved from Chigago, IL: Scientific Software International.
- Koppel, G. T., & Kaiser, D. (2001). Fathers at the end of their rope: A brief report on fathers abandoned in the perinatal situation. *Journal of Reproductive and Infant Psychology*, 19, 249-251.
- Lawrence, E., Bunde, M., Barry, R.A., Brock, R.L., Sullivan, K.T., Pasch, L.A., ... Adams, E.E. (2008). Partner

- support and marital satisfaction: Support amount, adequacy, provision, and solicitation. *Personal Relationships*, 15, 445-463.
- Le, Y., Fredman, S. J., & Feinberg, M. E. (2017). Parenting stress mediates the association between negative affectivity and harsh parenting: A longitudinal dyadic analysis. *Journal of Family Psychology*, 31, 679 - 688. doi:10.1037/fam0000315
- Leigh, B. & Milgrom, J. (2008). Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC Psychiatry*, 8.
- Liu, L., & Wang, M. (2015). Parenting stress and harsh discipline in China: The moderating roles of marital satisfaction and parent gender. *Child abuse & neglect*, 43, 73-82. doi:10.1016/j.chiabu.2015.01.014
- Manassis, K., Owens, M., Adam, K.S., West, M., & Sheldon-Keller, A.E. (1999). Assessing attachment: convergent validity of the adult attachment interview and the parental bonding instrument. *Australian and New Zealand Journal of Psychiatry*, 33, 559-567.
- Miettunen, J., Veijola, J., Lauronen, E., Kantojärvi, L., & Joukamaa, M. (2007). Sex differences in Cloninger's temperament dimensions – A meta-analysis. *Comprehensive Psychiatry*, 48, 161-169.
- Muthén, L.K. (2017). Personal communication.
- Muthén, L.K. & Muthén, B.O. (1998-2012). *Mplus* user's guide (7th ed.). Los Angeles: Muthén & Muthén.
- Nomaguchi, K., & Johnson, W. (2016). Parenting Stress Among Low-Income and Working-Class Fathers: The Role of Employment. *Journal of Family Issues*, 37, 1535-1557.
- Nygren, M., Carstensen, J., Ludvigsson, J., & Sepa Frostell, A. (2012). Adult attachment and parenting stress among parents of toddlers. *Journal of Reproductive and Infant Psychology*, 30, 289-302.
- Östberg, M. & Hagekull, B. (2000). A structural modeling approach to the understanding of parenting stress. *Journal of Clinical Child Psychology*, 29, 615-625.
- Parker, G. (1989). The parental bonding instrument: Psychometric properties revised. *Psychiatric Genetics*, 4, 317-335.
- Parker, G., Tupling, H., & Brown, L.B. (1979). A parental bonding instrument. *British Journal of Medical Psychology*, 52, 1-10.
- Pooler, E.E. (2011). *Comparison study: Depressed and non-depressed mothers' perceptions of their level of parenting stress and the influence on self-reported parenting style*. Doctoral Dissertation, Capella University.
- Potter, C. & Carpenter, J. (2008). ,Something in it for dads': Getting fathers involved with Sure Start. *Early Child Development and Care*, 178, 761-772.

- Provenzi, L., & Santoro, E. (2015). The lived experience of fathers of preterm infants in the Neonatal Intensive Care Unit: a systematic review of qualitative studies. *Journal of Clinical Nursing*, 24, 1784-1794.
- Rantanen, J., Tillemann, K., Metsäpelto, R.-L., Kokko, K., & Pulkkinen, L. (2015). Longitudinal study on reciprocity between personality traits and parenting stress. *International Journal of Behavioral Development*, 39, 65-76.
- Rholes, W.S., Simpson, J.A., & Friedman, M. (2006). Avoidant attachment and the experience of parenting. *Personality and Social Psychology Bulletin*, 32, 275-285.
- Rivard, M., Terroux, A., Parent-Boursier, C., & Mercier, C. (2014). Determinants of stress in parents of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 44, 1609-1620.
- Safford, S. M., Alloy, L. B., & Pieracci, A. (2007). A Comparison of Two Measures of Parental Behavior. *Journal of Child and Family Studies*, 16, 375-384.
- Saisto, T., Salmela-Aro, K., Nurmi, J.-E., & Halmesmäki, E. (2008). Longitudinal study on the predictors of parental stress in mothers and fathers of toddlers. *Journal of Psychosomatic Obstetrics & Gynecology*, 29, 213-222.
- Schappin, R., Wijnroks, L., Uniken Venema, M.M.A.T., & Jongmans, M.J. (2013). Rethinking stress in parents of preterm infants: A meta-analysis. *PLoS ONE* 8: e54992.
- Seah, C.K.F. & Morawska, A. (2016). When mum is stressed, is dad just as stressed? Predictors of paternal stress in the first six month of having a baby. *Infant Mental Health Journal*, 37, 45-55.
- Singer, L.T., Salvator, A., Guo, S., Collin, M., Lilien, L., & Baley, J. (1999). Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. *JAMA*, 281, 799-805.
- Spanier, G.B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 38, 15-28.
- StataCorp (2015). *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.
- Stoneman, Z., Brody, G.H., & Burke, M. (1989). Marital quality, depression, and inconsistent parenting: Relationship with observed mother-child conflict. *American Journal of Orthopsychiatry*, 59, 105-117.
- Suzuki, Y., Sakurai, A., Yasuda, T., Harai, H., Kitamura, T., Takahashi, K., & Furukawa, T. A. (2003). Reliability, validity and standardization of the Japanese version of the Social Adjustment Scale-Self Report. *Psychiatry and Clinical Neurosciences*, 57, 441-446.
- Theule, J., Wiener, J., Tannock, R., & Jenkins, J.M. (2013). Parenting stress in families of children with ADHD: A meta-analysis. *Journal of Emotional and Behavioural Disorders*, 21, 3-17.
- Treyvaud, K., Doyle, L.W., Lee, K.J., Roberts, G., Cheong, J.L.Y., Inder, T.E., & Anderson, P.J. (2011). Family

- functioning, burden and parenting stress 2 years after very preterm birth. *Early Human Development*, 87, 427–431.
- Treyvaud, K., Lee, K.J., Doyle, L.W., & Anderson, P.J. (2014). Very preterm birth influences parental mental health and family outcomes seven years after birth. *Journal of Pediatrics*, 164, 515-521.
- Van Bakel, H.J.A. & Riksen-Walraven, J.M. (2002). Parenting and development of one-year-olds: Links with parental, contextual, and child characteristics. *Child Development*, 73, 256-273.
- Vasquez, K., Durik, A.M., & Hyde, J.S. (2002). Family and work: Implications of adult attachment styles. *Personality and Social Psychology Bulletin*, 28, 874-886.
- Vermaes, I.P.R., Janssens, J.M.A.M., Mullaart, R.A., Vinck, A., & Gerris, J.R.M. (2008). Parents' personality and parenting stress in families of children with spina bifida. *Child: Care, Health and Development*, 34, 5, 665–674.
- Webster-Stratton, C. (1990). Stress: A potential disruptor of parent perceptions and family interactions. *Journal of Clinical Child Psychology*, 19, 302-312.
- Weissman, M.M. & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. *Archives of General Psychiatry*, 33, 1111-1115.
- White, J.M.W., Brotherson, S.E., Galovan, A.M., Holmes, E.K., & Kampmann, J.A. (2011). The Dakota father friendly assessment: measuring father friendliness in Head Start and similar settings. *Fathering*, 9, 22-43.
- Wilhelm, K. A. Y., Niven, H., Parker, G., & Hadzi-Pavlovic, D. (2005). The stability of the Parental Bonding Instrument over a 20-year period. *Psychological Medicine*, 35, 387-393.
- Willinger, U., Diendorfer-Radner, G., Willnauer, R., Jörgl, G., & Hager, V. (2005). Parenting stress and parental bonding. *Behavioral Medicine*, 31, 63-69.
- Zigmond, A.S. & Snaith, R.P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica*, 67, 361-370.

Table 1

Demographics of Fathers vs. Mothers in Both Groups

	Fathers (<i>N</i> = 294)		Mothers (<i>N</i> = 342)	
	NICU (<i>n</i> = 205)	Control (<i>n</i> = 89)	NICU (<i>n</i> = 242)	Control (<i>n</i> = 100)
Age	33.1 (5.9)	33.7 (6.0)	30.1 (5.4)	30.7 (5.4)
Ethnicity				
NZ European	82% (168)	83% (74)	77% (187)	82% (82)
NZ Maori	4% (8)	3% (3)	7% (16)	4% (4)
Other European	7% (15)	8% (7)	8% (20)	8% (8)
Pacific Islands	2% (3)	1% (1)	1% (2)	1% (1)
Asian	1% (1)	1% (1)	2% (4)	1% (1)
Other	5% (10)	3% (3)	5% (13)	4% (4)
Marital Status				
Married/defacto			88% (213)	90% (90)
Divorced/separated			3% (6)	1% (1)
Never married			10% (23)	9% (9)
Education				
Secondary/Trade	63% (86)	54% (32)	48% (61)	52% (29)
Professional Qual.	37% (50)	46% (27)	52% (65)	52% (29)
Annual family income				
NZ\$70000 or less			80% (192)	59% (59)
NZ\$70000 or more			20% (49)	41% (41)
Employment Status				
Employed	92% (170)	93% (74)	57% (121)	60% (39)
Unemployed	7.6 (14)	7.5 (6)	43% (92)	40% (58)

Note: Values are percentage (*N*) except for age where values are mean (*SD*)

Table 2

Mean Differences Between Fathers and Mothers on Study Variables

	Fathers			Mothers			
	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>U</i>
Parenting Stress	258	61.22	16.35	306	64.12	18.06	36229.50
Bonding							
MC	255	28.25	7.02	290	26.55	8.94	34090.00
MP	255	11.92	6.81	290	12.61	8.29	36204.50
PC	242	23.59	8.22	275	24.34	8.88	30954.50
PP	242	10.43	6.50	275	11.46	7.45	31100.50
Personality							
SD	263	16.33	3.70	295	16.31	3.82	38281.00
HA	263	5.88	3.87	295	9.13	4.58	23203.00***
Psychopathology	263	5.88	3.87	295	9.13	4.58	33833.00**
Social Adjustment	265	1.72	0.25	312	1.71	0.27	38733.00
Marital Satisfaction	242	117.94	13.42	251	116.63	16.24	30136.00

Note: SD= self directedness; HA= harm avoidance; MC/PC= maternal/paternal care; MP/PP= maternal/paternal protection. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Parenting Stress Model Fit Indices

Test	Results
Chi-Square Test of Model Fit	
χ^2	18.91
df	19
p	.46
Chi-Square Contribution from Each Group	
	10.44 (fathers)
	8.47 (mothers)
RMSEA estimate	0.00
CFI	1.00
SRMR value	.04
<i>Note:</i> χ^2 = Test of equivalence across gender	

Table 4

Predictors (B) of Parenting Stress in Fathers and Mothers

	Fathers	Mothers
Personality - S	-0.06	-0.05
Personality - HA	0.05	0.05
Psychopathology	0.25***	0.31***
Social Adjustment	0.21***	0.20***
Marital Satisfaction	-0.12*	-0.13*
Work	-0.06*	-0.10*
Child Variable	0.002	0.002

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Spearman Correlations Among Study Variables as Proposed in Belsky's model for Fathers and Mothers

	1a	1b	2	3	4	5
1a Personality – SD	-	-	-.30***	-.27***	.21**	.22***
1b Personality – HA	-	-	.26***	.29***	.22**	-.14*
2 Psychopathology	-.33***	.25***	-	.57***	-.41***	-.06
3 Social Adjustment	-.33***	.20**	.53***	-	-.48***	-
4 Marital Satisfaction	-.32***	-.21**	-.51***	-.53***	-	-
5 Work	.13*	-.10	-.23***	-	-	-

Note: Fathers results are below the diagonal and mothers above.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

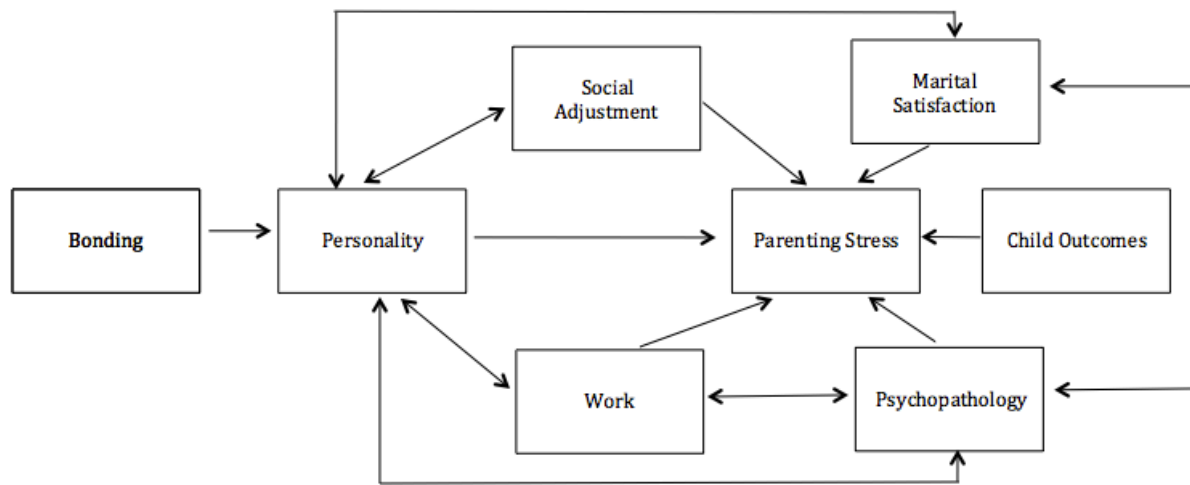


Figure 1. Adapted parenting stress model

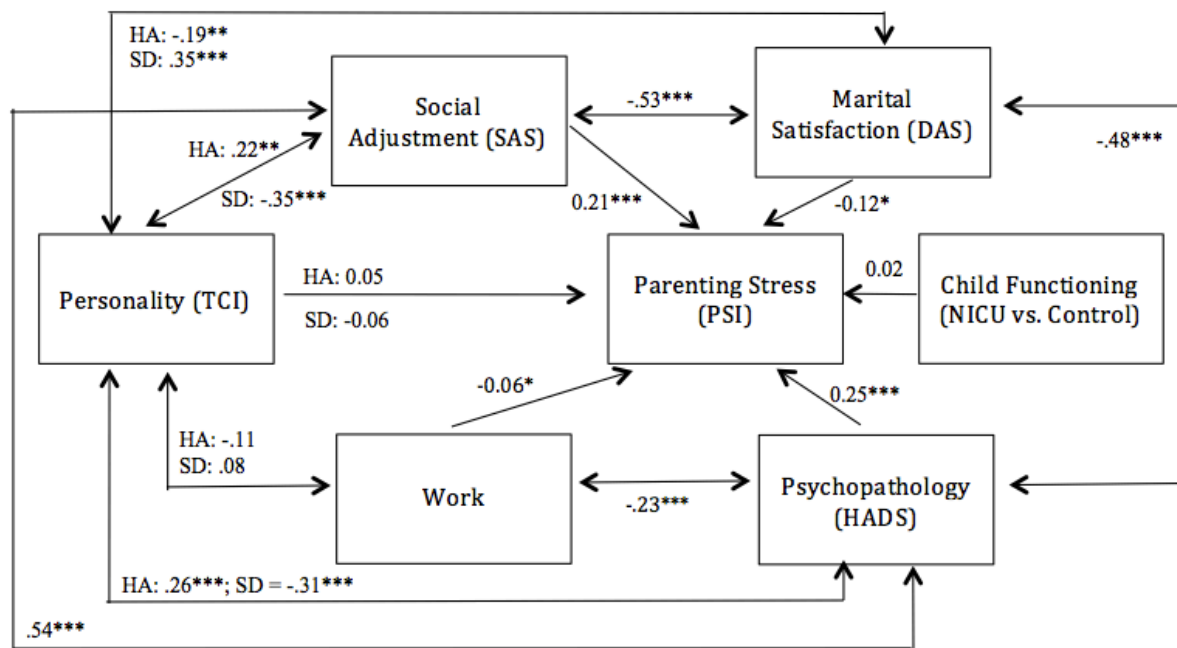


Figure 2. New parenting stress model & paternal results.

* $p < .05$, ** $p < .01$, *** $p < .001$.